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America No Longer Looks Abroad

By GILBERT L. LACHER

THE new administration at Washington is having difficulty reconciling a theory with a reality. Some of its leading spokesmen, among them Secretary Hull, adhere to the theory that tariffs must be reduced, that so-called economic warfare must stop. On the other hand, the Roosevelt regime has recognized a reality—the need for domestic industrial control—and this may well lead to greater protection rather than less. Regulation of domestic prices and wages can mean nothing without protection from foreign price cutting. This fact was brought out in an address herewith published, which was delivered before the New Jersey Foundrymen's Association at Newark on June 7.

PERHAPS the most important teaching of the depression is that we are indeed our brothers' keepers. No longer can we think only of our own business, our own profit, and ignore those in other walks of life. No longer can we excuse unemployment or dire poverty by shrugging our shoulders and saying, "The poor are always with us." Whether we like it or not we are united in fortune or misfortune. No man can stand alone against the mighty economic forces that control our destiny. But no man should accept ready made opinions as to what those economic forces are.

We have had a rapid succession of events since the new administration came into power on March 4. Most of us are bewildered as to their significance. Even Washington seems to be confused. All we are sure of is that there has been an impressive improvement in business, and we have our fingers crossed for fear something unlooked for will throw us back into the depths of despair.

Conflicting Counsels

We hear many conflicting counsels. Professor Moley, the President's right-hand man, tells us not to expect too much from the London Economic Conference, that business recovery will spring from domestic causes. Sec-

retary Hull and our ambassador at the Court of St. James, on the contrary, attach the utmost importance to the outcome of the London conference, declaring that so-called economic warfare must stop, that tariffs must come down. Just as the conference is about to convene we witness the administration launching an industrial control program, which is intended to boost domestic prices and wages and to spread employment and buying power. It is not explained how our wages and prices can be increased

at the same time that our tariffs are reduced. Why waste the effort trying to stop wage slashing and price cutting in this country, if we are to lower the barriers to foreign price cutters?

The answer is that the administration is still trying to reconcile a reality with a theory. The reality is that so long as unrestricted competition permits the unscrupulous or the hard-pressed to slash wages and prices, there is no assurance that the downward spiral which has wiped out



profits, piled up deficits and in some industries reduced labor to sweat shop levels can be stopped.

The theory is that our tariff has in some manner or other caused the depression and we must lower it to attain recovery. We are told in one breath that we must import more so that foreigners can pay us interest on their debts. We are told in another breath that we must import more so that our farmers can increase their exports. How we can do both is not explained. If we must have an import surplus because of our creditor position, it is difficult to see how our commodity exports can be expanded.

However, all of these arguments start with certain assumptions, and we should examine these assumptions. First we are told that our exports have declined sharply because of our tariff; further that the farmer has been penalized because he must pay toll to American industries subsidized by the tariff. Secondly, there is the assumption that we are the world's leading creditor nation.

How Much Have Exports Declined?

Let us examine the first assumption. It is true that our exports have declined sharply in value, but world values generally have dropped. The real question is whether exports have dropped in quantity, and if so, how much? If we compare the quantity of our exports with the average for the admittedly prosperous but not abnormal years, 1923 to 1925, we find that 1931 showed a decline of only 11 per cent, as compared with a drop of 26 per cent in our industrial production. Even in 1932 the decline in exports was much smaller than the recession in industrial production, the drop for exports being 31 per cent and that for industrial output 45 per cent. Hence domestic business has suffered much more than our export trade, instead of the reverse, as has been popularly supposed.

And how about agricultural exports? Have they suffered the most? The exact contrary is the case. The quantity of our farm exports in 1932 was only 16 per cent below the 1923-1925 average and was 8 per cent higher than in 1931. Similarly our exports of crude materials were not only 7 per cent higher than in 1931 but were 15 per cent higher than in the years 1923 to 1925.

And it is interesting to note, in view of frequent references to the farmers' excellent pre-war position, that our agricultural exports, again in quantity, were less than 6 per cent smaller in 1932 than in 1913. This is a remarkable showing. In fact, considering the sharp post-war expansion of agricultural capacity throughout the world, it is difficult to see how our farm exports could be materially increased, tariffs or no tariffs.

At this point our academic friends

usually shift their attack and say, "What you say about exports may be true, but the sharp decline in imports, caused by our high tariff, has in turn caused the sharp drop in our industrial production." Let us see what the import figures disclose. Our total imports in 1932 (in terms of quantity again) were only 22 per cent below the 1923-1925 average, as against the decline of 45 per cent in the physical volume of our industrial production. And what is even more surprising, our 1932 imports were 26 per cent above the 1913 total. So we find that neither imports nor exports have declined nearly as much as domestic industrial activity. But even if our foreign trade had declined more, in fact even if it had been wiped out, it could hardly account for the drastic fall in our industrial activity. Our exports, on the average, equal only 6 per cent of our national income—the physical volume of our industrial production, as previously pointed out, has shrunk 45 per cent.

Europe's Problems Unlike Ours

The whole difficulty is that we have gotten our theories on economics from Mother Europe and conditions across the Atlantic are radically different from those obtaining here. European countries, in contrast with the United States, are indeed dependent in high degree on their foreign trade. In the three years 1927 to 1929 average annual exports represented 20 per cent of the national incomes of Great Britain and Germany, 22 per cent of the national income of France, 31 per cent of that of the Netherlands, 33 per cent of that of Czecho-Slovakia and 55 per cent of Belgium's.

Those countries must of necessity concern themselves about foreign trade. But in our case domestic trade is of far greater importance. At the very time that we are being bombarded with arguments for freer trade with other countries we possess within our own borders the largest free trade area in the world. Although we have only 6.3 per cent of the world's population, we consume 62 per cent of the world's rubber, 61 per cent of the petroleum, 73 per cent of the silk, 45 per cent of the steel, 48 per cent of the tin, 42 per cent of the copper, 37 per cent of the zinc, 36 per cent of the lead, 27 per cent of the coffee and 21 per cent of the sugar. Moreover we operate 74 per cent of the world's motor vehicles.

Surely our main concern should be to revive our great domestic economic machine which makes such tremendous consumption possible instead of worrying about what are relatively crumbs of business in the foreign sphere.

The Cotton and Wheat Problems

"But what about our wheat and cotton?" our free trade friends ask. "Our farmers must find an outlet for their surplus crops." Now as a mat-

ter of fact the *quantity* of cotton exported in 1932 was 21 per cent greater than in the boom year 1929. While wheat exports (including flour) were lower in 1932 than in 1931, the 1931 volume was 20 per cent greater than the average for the good pre-war years 1910 to 1914. But there is no question that world demand for our wheat has declined and no amount of tariff tinkering will alter that fact. European industrial countries are supplying a larger percentage of their own foodstuffs, Russia is rapidly expanding her wheat acreage and Canada, Argentina and Australia, with their cheap lands, have become major producers for the export market. And it must not be forgotten that per capita consumption of wheat in civilized countries is receding because of changing diets.

Cotton and wheat have become fetishes to the internationally minded. They are given much more attention than they deserve. In recent years our gross income from vegetables has been higher than our income for all grains. In 1932 even our income from fruits and nuts was in excess of that for grains. Similarly the 1932 income from poultry and eggs was three times that from wheat, and the income from dairy products was seven times as great.

Carrying the comparison to cotton, we find that poultry and eggs are more valuable than the entire cotton crop, while the income from dairy products is 50 per cent greater.

Agriculture Chief Beneficiary of Tariff

And when we give further consideration to the low tariff demands of the farmers and planters, we find to our surprise that agriculture is the chief beneficiary of protection. Our last tariff act raised the average duty on dutiable imports from 33.2 per cent to 40 per cent. However—and this fact should not be overlooked—the average rate on dutiable agricultural products was increased from 38.1 per cent to 48.9 per cent, while that on dutiable non-agricultural products was increased from 31 per cent to only 34.3 per cent. In 1932 five groups of agricultural imports accounted for nearly two-thirds of all the duties collected during the year. Sugar and molasses alone accounted for nearly 30 per cent of our total tariff revenue, or only slightly less than the entire revenue received on imported manufactures.

The entire nation pays large indirect taxes because of our duties on farm products. On the other hand, the farmer actually is relatively free from such indirect taxes on the things he buys. Under our tariff agricultural implements, barbed wire, fertilizers, coffee and tea are free. Unmanufactured wood, ultimately used by him, is free. The rubber in his automobile tires is free. The news-

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RIGOROUS factory inspection of the cutting edge of the safety razor blade and efforts to determine the keenness of the edge have led to a special application in the one case of the photoelectric cell used in conjunction with the microscope and to the devising in the other by the author of a non-destructive tester, which can give the quantitative measure of sharpness according to a series of Woodward sharpness numbers. Some advice to the user on the care of blades is added gratuitously. The article continues the author's description of the processes and problems of manufacture, in **THE IRON AGE** of May 25.

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Testing Safety Razor Blades

By **DR. R. W. WOODWARD**
Consulting Metallurgical Engineer

THERE are many tests, other than routine inspection, which are very useful in studying finished blades, pointing out defects in manufacture, and improving quality. The metallurgical microscope is indispensable for many of these tests. It can be used for examining the structure and fracture of the metal, the character of the cutting edge, the cutting angle, and for hardness tests.

Figs. 5, 6 and 7 show fractured cross-sections of these separate blades at a magnification of 100 diameters. The grain structure is fine and satisfactory in all, but there is considerable difference in the cutting angle of the three. Fig. 6 shows a greater included angle right at the tip due to excessive removal of metal in the honing and stropping operation.

The cutting angle is measured by means of a filar eyepiece in which the cross-hairs may be rotated and the angle measured, or a rotating stage plate may be used.

The microstructure should show the carbides fine and well distributed without appreciably outlining the boundaries of the original austenitic grains. Fig. 8 shows an acceptable structure, while in Fig. 9 the carbides are rather large and their arrangement suggests the original austenitic grain boundaries. In Fig. 10 the structure is satisfactory but there are bad streaks of inclusion which made this blade apparently brittle.

In viewing the cutting edge it is desirable to make the examination both on a side view and also directly toward the edge, i. e. with plane of the blade parallel to the axis of the microscope. We often hear and read statements to the effect that the edge of a razor blade is saw-toothed, and that its action is similar to that of a saw. Such is not the case and the

field of view is rather restricted and it becomes increasingly difficult to secure a field flat enough for uniform focusing.

Figs. 11 and 12 show the corresponding side and edge views of two blades which are typical of satisfactory blades. Perfection has not been attained in these, but the departure of the edge from a straight line is very small.

Contrasted to these, Figs. 13 and 14 show varying degrees of nicked and ragged edges. These defects occurred in the grinding operations, and subsequent operations have merely rolled over some of the projections without, of course, correcting the condition. Fig. 15 shows a rolled over or wire edge not accompanied by large nicks, indicative of faulty grinding

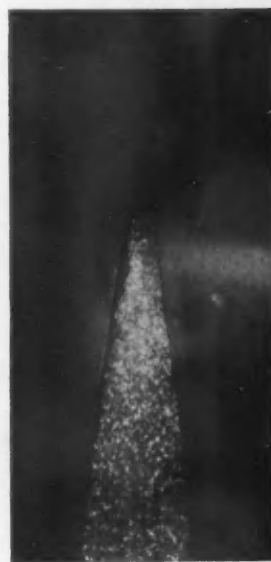


Fig. 5



Fig. 6



Fig. 7

Fractures of cutting edges of razor blades at 100 magnifications show variation in cutting angle and, in the case of Fig. 6, of the increased angle at tip.

*194 Warrenton Avenue, Hartford, Conn.

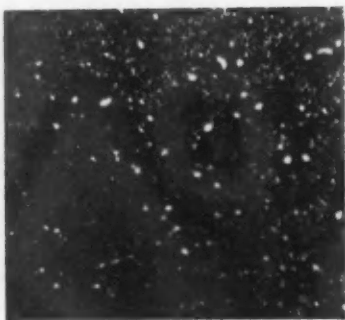


Fig. 8

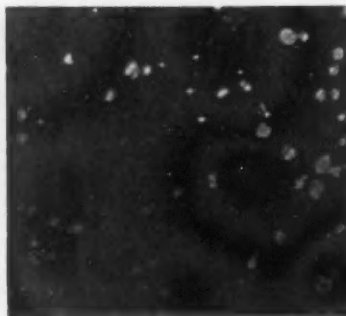


Fig. 9

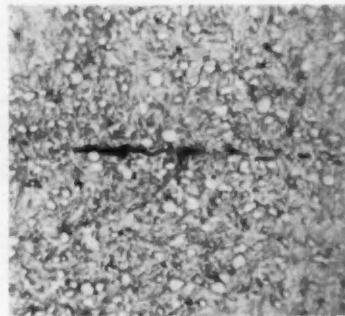


Fig. 10

Microstructure of heat-treated razor blades at 1000 magnifications: Fig. 8, satisfactory structure; Fig. 9, carbides too large and not well distributed; Fig. 10, structure excellent but streaky.

which could have been considerably improved by more efficient honing and stropping. Figs. 16 and 17 show edge views of blades which would not be considered entirely satisfactory, that in Fig. 16 having a badly rolled over edge, and that in Fig. 17 being slightly out of line.

Hardness tests of the blades can be made as previously described for the raw material except that a 150-kg. load is used with the 1/16-in. ball. With this test the range of computed Brinell hardness usually encountered is from 600 to 675. Below this figure the edge will roll over readily, and above it the steel is too brittle and chips out in use, or a double edge blade may break when flexed in the holder. As previously intimated, magnetic testing for hardness may also be carried out on the finished blades or on the strip while still in process of manufacture.

A bend test is also useful in ascertaining that the blade has secured proper hardening treatment and will not be subject to breakage in use. The test is conveniently carried out in a fixture which clamps one half of the blade along the center line between blocks. The projecting half is fitted into a slot in a movable block to which is attached a pointer moving over an arc graduated in degrees.

By bending the blade along the center line the angle of fracture is determined. As carried out on a number of specimens this angle should be uniform within a small tolerance. Any large variation shows faulty heat treatment or dirty steel. If the angle of bend at fracture is 45 deg. or less, trouble with the blades breaking in service may be expected. On the other hand if the angle is much over 85 deg. the blades are not hard enough. Obviously this test is of no value on blades which are differentially tempered to leave a soft center.

Testing Edge with Photoelectric Cell

Testing for sharpness is now receiving much more attention than formerly, and such tests need no longer be dependent upon the personal equation. There are two general types, one of which is more strictly a measure

of keenness, and determines the width of the cutting edge; the other is a standardized cutting test.

The first named method accomplishes its purpose by measuring photo-electrically the width of the edge much as the width of the white line showing in Figs. 11, 12, 16 and 17 could be measured with a scale. The edge is set up in the field of a microscope as for visual examinations, the source of illumination being carefully controlled, but the image of the edge is directed on the sensitive part of a photo-electric cell. The resulting feeble electric current is amplified through a vacuum tube system and its value measured. A small electric current indicates a fine or keen edge. The

blade may be drawn along and variations in keenness or an average value determined. The advantage of this method is that it is entirely non-destructive. However, an edge that is of proper keenness, but lacking in proper hardness and consequently cutting ability, will give as favorable reading as a hard, keen edge. It must therefore be supplemented by other tests for hardness.

One form of standardized cutting test is to cut through a pile of thin, uniform strips of paper by applying the blade under a constant fixed load. The number of strips of paper that are cut is taken as an index of sharpness. Since successive repetitions of the same test until the blade fails is taken as a life test for the blade, it is seen that the test is destructive to the blade, and hence blades tested in this manner cannot subsequently be used for actual tests.

Woodward Sharpness Tester

The writer has devised the Woodward sharpness tester, which overcomes the last named objections and has worked out very satisfactorily in testing new blades and also for testing blades before and after shaving throughout their life. In this test the load to cut through a single standardized fibre is measured, and the index of sharpness expressed as a function of the tensile strength of the fibre. The load is uniformly applied through a motor-driven mechanism, and the instrument contains means for standardizing and calibrating. As with Brinell hardness figures, the Woodward sharpness numbers increase rapidly with increasing sharpness.

The usual commercial run of blades give sharpness numbers from 250 to 400, the highest observed being about 500. From experience it has been found that sharpness numerals below 200 fail to give satisfactory shaves for most users. Tests can be made at several points to observe uniformity, and tests on a given location on the blade can readily be made before and after shaving. On blades of proper hardness this test is non-destructive as evidenced by viewing the edge under the microscope. However, if the blade is too soft the test will slightly roll over

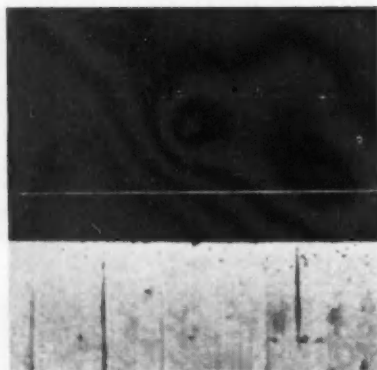


Fig. 11

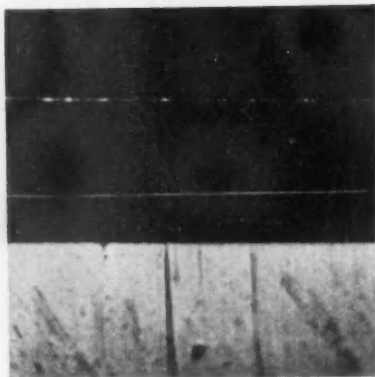


Fig. 12

Figs. 11 and 12 show side and edge views, in both cases, of satisfactory blades.

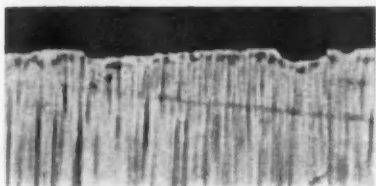


Fig. 13

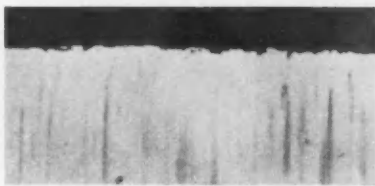


Fig. 14



Fig. 15

Figs. 13, 14 and 15 are side views of unsatisfactory blades; Fig. 13, emphasizing nicked and ragged edge; Fig. 14, ragged edge, and Fig. 15, rolled over or "wire edge."

the edge at the test spot, or if it is too hard a very fine nick will result.

Failure of Blades in Service

As in the case of all structures, much instructive information can be obtained from the examination of specimens that have failed in service. This is illustrated by a few representative cases.

Fig. 18 shows the side and edge views of a blade that was discarded during the eighth shave. The edge has become badly turned over. When this blade was new it gave a Woodward sharpness numeral of 273 and an excellent shave. Its shaving ability gradually decreased, and upon discarding the sharpness numeral had decreased to 140, much below that necessary for a satisfactory shave. Hardness tests showed that this blade was too soft, namely, 575 Brinell.

Fig. 19 shows another type of failure in a soft blade. This blade had a hardness of 591 Brinell and was discarded after five shaves when it was found to be badly nicked. The original sharpness was very high, about 400, but fell off to about 225 in places where there were no nicks.

In Fig. 20 is shown a blade discarded after five shaves. This blade contained deep grinding scratches which

were not removed by finer wheels or by honing and stropping. Portions of the edges nicked out at the heavy grind marks.

Too great a hardness is equally detrimental. Fig. 21 at A shows a new

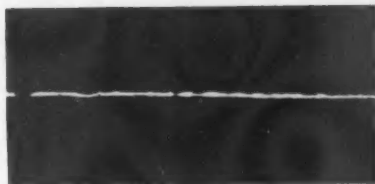


Fig. 16

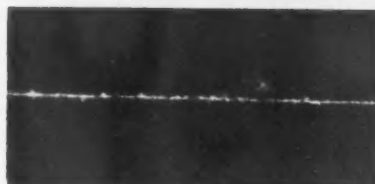


Fig. 17

Figs. 16 and 17 are end views of poor blades, the one showing the rolled-over edge, and the other one slightly out of line and discontinuous.

blade with a very good edge, but it gave only six satisfactory shaves. Fig. 21 at B shows the same location on the blade and a large nick. The

hardness of this blade was 740 Brinell, and the cutting angle 8 deg., both of which factors contributed to early failure.

Fig. 22 illustrates a blade with an original sharpness of 250, which was discarded after ten shaves when the sharpness was down to 170. The edge is quite wide and extremely wavy. The properties of this blade were not unfavorable, and the life is about what may be expected of an average blade with normal use.

Care of Blades

There are many things which the user of razor blades can do to increase materially their life. In the first place all blades should be carefully cleaned and wiped dry after using. This applies equally to blades that are coated with lacquer, as the lacquer does not cover the cutting edge. At one time one of the subjects whom the writer was using to test blades repeatedly reported short life which could not be reconciled by the properties of the blades. Investigation showed that he merely rinsed the blade in its holder without removing for cleaning.

Rust is one of the greatest enemies of blades, and even a small amount of moisture on the cutting edge will quickly ruin the best of blades. It is (Concluded on Advertising Page 14)

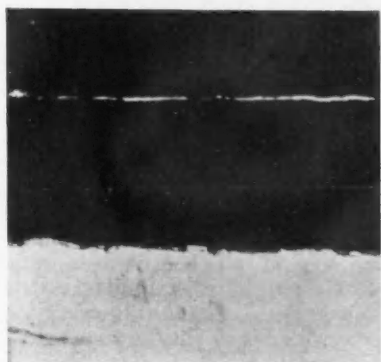


Fig. 18

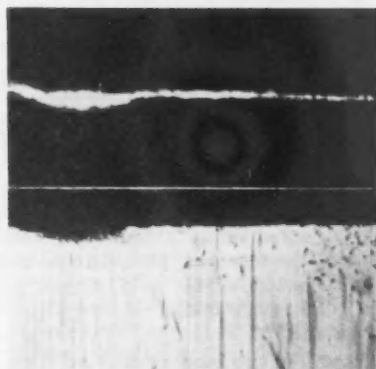


Fig. 19

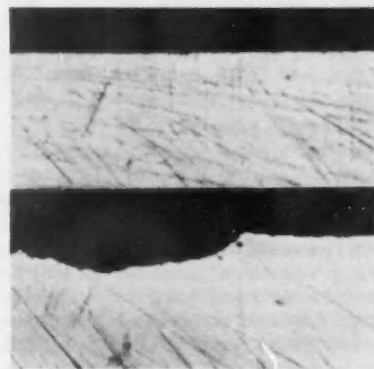


Fig. 21 A and B

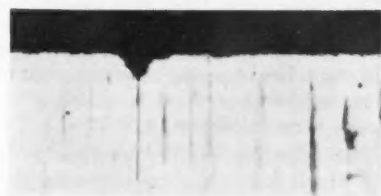


Fig. 20

FIGS. 18 to 22, inclusive, cover failures in used blades; Fig. 18, the turned-over edge on soft blade; Fig. 19, nick in soft blade; Fig. 20, nick that developed at heavy grinding scratch; Fig. 21, nick in blade that was too hard; and Fig. 22, edge of worn-out blade.

(Figs. 11 to 22, inclusive, are all of 500 magnifications, reproduced to two-thirds of the original.)

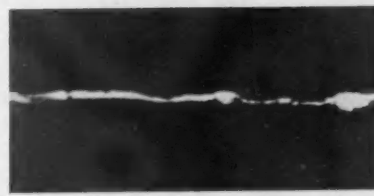


Fig. 22

Rustless Steels in the German Brewing Industry

By Dr. M. H. SOMMER

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THE brewing industry offers great possibilities for the application of rustless steels, and in the face of the impending revival of this old and big industry in this country the writer could not resist the temptation to study during a recent trip through Germany the various uses of rustless steels in breweries and to collect information on the corrosion resistance and durability of brewing implements made entirely or partly of rustless steels and in regular service over a period of as much as ten years.

Rustless steel is today widely employed in the brewing industry in a number of important applications, such as barrels for shipment and storage of beer, fermentation vats, storage and railroad tanks, yeast pans, siphon-bottles, auxiliary vessels, clarifiers and many other parts. There are many other applications where rustless steel could be advantageously used, but the high prime cost of such implements together with the cautious attitude of this conservative industry in adopting new construction materials has delayed their introduction. The first experiments with beer barrels and fermentation vats were made in Germany in 1920 and 1921 and the oldest vessels which the writer has seen are now about 11 years in actual use.

The composition of rustless steel used for brewery equipment in Germany is the well-known 18-8 steel (18 per cent chromium, 8 per cent nickel, remainder iron) which had been patented by Krupp in Essen. Krupp set up a plant in Essen for the fabrication of brewery equipment from rustless steels and formed a separate company to handle propaganda and sales.

Exhaustive tests had to be conducted to establish the suitability of this steel in four directions:

- 1.—The effect of chemical cleansing agents upon the steel
- 2.—The effect of the fermenting liquid upon the steel
- 3.—The galvanic action between rustless steel and other metals used for brewery equipment in contact with beer

4.—The intercrystalline corrosion of welded parts

Furthermore it was deemed important to ascertain the behavior of the steel under conditions where it is not fully resistant against corrosion. A general and uniform attack is usually the less dangerous (if an eventual action of dissolved metal upon the beer or beer-wort is not considered), while a local pitting effect might easily and quickly eat holes into the steel and render the entire vessel unserviceable. It is interesting to note that similar experiments have been conducted by the British Bureau of Bio-Technology and have led in general to the same results.

Disinfectants and Cleansing Agents

Professor Lueers, director of the laboratory for applied chemistry in Munich, investigated the corrosion resistance of the chrome-nickel steel to cleansing agents and disinfectants commonly used in breweries. He also made actual tests to determine the loss of weight of such steels exposed to fermenting beer-wort and carried out a number of fermentation processes in small trial vessels of chrome-nickel steel to ascertain the conditions of the yeast and the beer and the taste of the latter. He found that the trial vessel appeared entirely unaffected in each instance, the yeast was white and normal, and he could not detect anything extraordinary in the taste of the beer. He also scrutinized separately the influence of the acids which are formed in the fermentation process, i.e. phosphates (potassium phosphate) and organic acids (lactic acid), upon the steel. An extract of his results is reproduced in Table I.

Summing up the results of these tests, the steel can be considered practically neutral against the disinfectants used, as even under very severe testing conditions only small amounts of metal have gone into solution. The larger attack of hydrofluoric acid is only of theoretical interest since free hydrofluoric acid is never used in disinfecting agents, especially not in such concentration. Fermenting and boiling wort and the acids formed in this process show no influence on the steel.

A more elaborate investigation which deals with the action of disinfectants and cleansers upon different metals used in the food industry in general was carried out by the laboratory for metallurgy of the Technical College in Berlin a few years ago. About thirty disinfectants and cleansers were tested but to refer in detail to them is not within the scope of this article. A brief extract of the results on metals which are mostly used for brewery equipment is given in Table II.

The chrome-nickel steels were not attacked by any of the chemicals except slightly by an agent containing 80-90 per cent chloride of lime and by a composition of 80 per cent silicofluoric acid and 8 per cent formaldehyde at a concentration of 0.5 per cent. The results of the action of the chemicals on welded 18-8 steel show that the welding seam itself and the material adjacent to it are equally resistant. The investigators say in their conclusion that: the iron-chromium alloys with nickel, known as 18-8, have shown the best corrosion resistance and are chemically the most suitable material.

It cannot be denied that traces of metal go into solution during the fermentation process but it has been found that this dissolution is very much less in vessels of rustless steel than in those of other metals and that these negligible metallic ingredients of the beer are not injurious to the health. This has been confirmed in an investigation which the Bureau of Standards in Washington made some time ago of cooking utensils which were fabricated of a similar rustless composition. All the brewery experts with whom the writer had an opportunity to discuss the question agreed that the character of the beer as regards stability, brilliancy, fullness, etc., has not been adversely affected through the use of rustless steel vessels and they stated that they had not heard any case where the flavor of the beer had been impaired by the steel in any way.

The galvanic action between rustless steel and other metals used for brewery equipment has been thoroughly investigated by Schafmeister

wing Industry

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A FEATURE of this article, aside from showing the popularity of rustless steel in the brewery industry, is its tabulation of tests of the resistance of the material to corrosive chemicals, such as those used as disinfecting and cleansing agents. The information therefore has a value far beyond the brewery application, which incidentally was discussed at some length in **THE IRON AGE** of March 23.

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and Tofaute. They formed galvanic elements with pieces of two different metals as electrodes and beer as electrolyte and connected the electrodes through a galvanometer. The danger of electrolytic attack is very slight in a combination of 18-8 and copper and on the whole the experiments offer an excellent guide for the selection of metals and alloys for brewery equipment where two metals are in contact, as, for example, cooling coils in fermentation vats or yeast pans with copper pipes.

Intercrystalline Corrosion

Last but not least important for such applications as fermentation vessels, storage tanks and other large containers, which must be welded from a number of sheets is the prevention of intercrystalline corrosion adjacent to the welding seam. It is well known that the austenitic chrome-nickel steels are susceptible to carbide precipitation if heated to temperatures between 1000 and 1500 deg. F. In welding large vessels there are zones adjacent to the welding seams where such temperatures have been reached during the welding operation. This carbide precipitation causes a speedy corrosion of the steel and the welded parts fail rapidly. No damage can occur when the welded part is properly heat treated subsequent to the welding operation. This cannot be done, however, with large vessels, since annealing furnaces large enough to heat the completed vessel do not exist, and even if the annealing could be done the necessary quenching after heating would warp the tank to such a degree that it could not be straightened again.

Great efforts have been made to find a solution of this problem and it shall suffice here to refer to the ex-



Van load of rustless steel barrels for beer

cellent work of Mr. Newell on this subject. Restriction of the carbon content and suitable heat treatment to produce a small grain have been found to give the best alloy for such applications where welding has to be done without the possibility of a subsequent heat treatment. In the selection of the welding method, arc welding should be preferred on account of its more condensed heat.

Rapid Adoption in European Breweries

After it was proved that rustless chrome-nickel steels are immune to beer and to the corrosive action of the various cleansing agents and disinfectants used in breweries and is not affected by galvanic action in contact with other metals, provided proper precautions are taken, the introduction of this material for brewery equipment made rapid progress in Germany and other European countries. Numerous installations have been made during the last ten years wherever the savings in maintenance costs justified the higher prime cost of the rustless steel or where other metals had failed.

Nearly every large brewery in Germany and many other countries in Europe has some equipment made of rustless steel and the writer has heard no complaints except on faulty construction, which has since been corrected, of the first implements made. This applies chiefly to barrels for shipment of beer.

Beer Barrels

Rustless barrels are fast replacing wooden or iron barrels or bottles for beers which have to be pasteurized. The growing demand for surface-fermented beers mixed with sugar, so-called caramel or maltbeers, makes a pasteurization of such beer necessary to prevent it from fermenting

again before it is consumed. Ordinary beers for export, which are in transit for many months, require also pasteurization to maintain their quality and conditioning. The advances in brewery technique made it possible to guarantee an export beer without pasteurizing for as many as three months, but beer shipments with distant destinations are much longer in transit and storage and they have previously been pasteurized and shipped in iron barrels lacquered on the inside.

The iron containers which in some cases are returned to the brewery only after one or even two years were naturally in a very bad condition and oftentimes it did not pay to recondition them again. The wooden barrel is not suitable for the pasteurization process on account of its low heat conductivity and other obvious reasons. Sugared beers have previously been pasteurized in bottles which is necessarily a slow and expensive process. For these reasons the rustless barrel found its way easily into the breweries and has been a complete success. The writer has seen rustless barrels which have traveled several times around the globe and were still in perfect condition. They did not require any maintenance except the usual cleaning with steam followed by a soda solution and rinsing with water, which is sufficient for such containers.

The rustless beer barrel is made of a metal thickness from 0.060 to 0.080 in., according to its capacity, which is standardized to 30, 50 and 100 liters. It is tested at a pressure of 110 lb. per sq. in., to guarantee its tightness under the increased pressure of the liquid at the pasteurizing temperature of 150 deg. F.

The barrel is made of two halves which are drawn from round blanks in several operations, properly pick-

TABLE I—TESTS BY PROF. LUEERS ON CORROSION RESISTANCE OF CHROME-NICKEL STEEL (18-8) TO DISINFECTANTS AND CLEANSING SOLUTIONS

Disinfectants:	Per Cent	Weight of Immersed Sample, G.	Loss in Weight After Eight Days Immersion	
			Actual	Per Cent
Ammonium fluoride.....	2	7.1809	0.0018	0.025
Hydrofluoric acid.....	2	7.1814	0.1251	1.742
Silicofluoric acid.....	4	7.3973	0.0000	0.0
Sodium hypochlorite, 3 g. chlorine per liter..		7.1213	0.0001	0.009
Sulphurous acid.....	3.6	7.3686	0.007	0.007
Potassium phosphate.....	1/15	7.0370	0.0005	0.007
Lactic acid.....	1/50	7.1765	0.0005	0.007
			After Ten Days Immersion	
Fermenting beerwort.....		7.3975	0.0007	0.009
Same (second test).....		7.1192	0.0008	0.011

led and annealed. Originally these halves were set up in a spinning lathe to work out the hoops with an inside spinning roll. This design was not rigid enough, however, especially with regard to the old habit of the drivers of the brewer's vans to throw the barrels from the van to the ground and this rough handling caused many bad dents of the rustless barrels. Therefore, the construction of the barrels was changed and a separate hoop of heavier gage metal is now spot welded to each half. A welded ring is then pressed over the

bottom of each part and spot welded and two rectangular slits are provided in the upper ring for lifting and carrying the barrel. These rings afford an excellent protection and make it possible to set the barrels upright. The two halves are then welded together in an automatic welding machine, and the whole carefully pickled, cleaned and tested. Barrels of the reinforced design are shown in one of the accompanying illustrations and the picture demonstrates also the proper method of unloading.

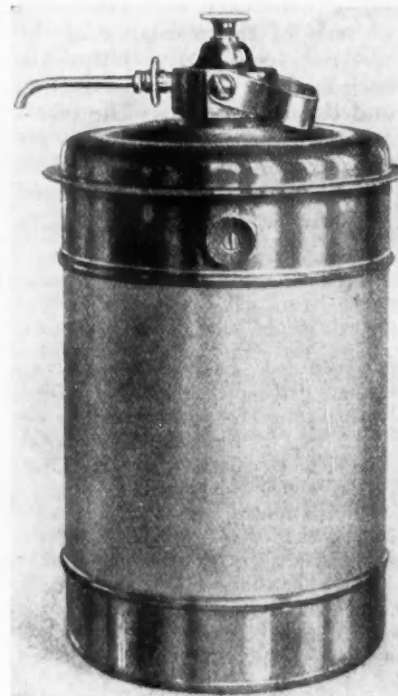
TABLE II—BEHAVIOR OF METALS TO CORROSIVE AGENTS

Disinfectants:	Concentration, Per Cent	Iron	18-8	18-8 Welded	Copper	Iron Tinned	Aluminum, 99.5 Per Cent	Enamel
Containing chlorine								
A—80-90 per cent chloride of lime.....	0.05	***	*		***	*	—	—
B—Sodium hypochlorite, 150 g. chlorine per liter.....	0.5	***	—	—	**	*	—	—
C—80 g. sodium hydrate and 78 g. chlorine per liter..	0.5	***	—	—	**	**	***	*
D—22 per cent chlorine.....	0.5	***	—	—	**	*	**	—
E—25 per cent chlorine.....	0.5	***	—	—	**	—	—	—
F—53 per cent sodium carbonate and 11 per cent chlorine.....	1.5	***	—	—	—	**	***	*
G—Same as F plus potassium silicate.....	1.5	***	—	—	**	—	—	—
H—26 per cent sodium hydroxide and 0.4 per cent chlorine.....	1.0	—	—	—	**	**	***	*
I—18.8 per cent soda and 0.09 per cent chlorine.....	1.0	—	—	—	**	**	***	—
Containing formaldehyde								
K—40 per cent formaldehyde, H ₂ CO.....	3.0	**	—	—	**	—	—	—
L—8 per cent formaldehyde and 80 per cent silicofluoric acid.....	0.5	***	*	—	**	***	***	—
M—Formaldehyde, saponin alcohol and water.....	1.5	—	—	—	**	—	—	—
Mixtures of alkaline base; sodium and saponin compounds; without potassium silicate								
N.....	0.5	—	—	—	**	—	—	—
O.....	0.5	—	—	—	*	—	***	*
P.....	0.5	—	—	—	**	**	***	*
Q.....	0.5	—	—	—	**	**	***	—
R.....	0.5	—	—	—	**	**	***	—
S.....	0.5	—	—	—	**	**	***	—
T.....	2.0	*	—	—	*	**	***	—
With potassium silicate, 38 Baume ccm per liter								
Cx 6 ccm { Sufficient.....	0.5	***	—	—	—	—	—	—
Gx 1 ccm { to.....	1.5	***	—	—	**	—	—	—
Hx 18 ccm { prevent.....	1.0	—	—	—	—	—	—	—
Ox 18 ccm { attack.....	0.5	—	—	—	*	**	—	—
Px 24 ccm { on.....	0.5	—	—	—	—	—	—	—
Tx 18 ccm { aluminum.....	2.0	—	—	—	**	**	—	—
Cleansing agents with alkaline base; sodium and saponin compounds								
1 { Not sufficient.....	5.0	—	—	—	*	*	—	—
2 { for.....	2.0	***	—	—	—	—	—	—
3 { disinfection.....	1.0	***	—	—	—	**	**	—
4 { in any.....	1.0	—	—	—	—	—	—	—
5 { concentration.....	0.15	***	—	—	—	**	**	—
6 Wyandotte.....	1.5	***	—	—	—	**	**	—

Attack on 100 square centimeters of metal surface in 24 hr. at 45 to 50 deg. C. Symbols used: — no attack, * very slight attack, ** general attack, *** local pitting. **** very heavy attack.

Another advantage of the rustless beer barrel which should not be overlooked is the saving on weight and displacement of this container against a wooden barrel of equal capacity. The load of a delivery van can be increased by about 25 per cent and in railroad shipments 2650 gal. can be transported in a 15-ton railroad car against 2000 gal. previously in wooden barrels.

The only objection which could be and has been advanced against the transportation of beer in rustless



Siphon-bottle for beer is entirely of rustless steel polished and partly buffed on the outside

barrels is the possible damaging influence of the outside temperature on the beer. It might become too cold in the winter and too hot in the summertime and too great a change in temperature would be detrimental to the quality and the character of the beer. Comparative tests which have been made on rustless and wooden barrels have shown, however, that the change in temperature of the beer in the rustless container is only 4 to 6 deg. F. greater than in the wooden one. In both instances the barrels must be covered when in transit at times of extreme temperatures.

Another type of barrel, which has been developed by Krupp, is also here shown. It consists of a rustless steel container within an iron case, the latter being bulged in the same manner as the wooden barrels. The gage of the rustless steel part can be considerably lighter in this construction because it is protected by the iron shell. At the same time the layer of air between the two walls effects an excellent insulation.

Next to barrels rustless steel is chiefly used for fermentation vats and

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storage tanks. Such implements require large quantities of raw material. The prime cost for rustless steel fermenting vats and storage tanks is on the average 33 per cent higher than for such vessels made of iron enameled but this expense is amply justified according to the statements of the various breweries which the writer has visited.

The storage tanks which have usually a capacity of 4500 to 9000 gal. are constructed of welded sheets with dished heads on both ends; a man-hole is provided on one end for cleaning the tank and the fittings are screwed into welded-in threaded rings. The inside of the tank is absolutely smooth.

The clearing-pans previously made from wood, which are placed inside the tanks to increase the surface for the sediment of the yeast, are now also made of rustless steel. Asked why rustless steel was preferred, a

▲ ▲ ▲
New type rustless
steel barrel for ship-
ment of beer de-
veloped by Krupp
▼ ▼ ▼



large brewery which has installed 80 such tanks stated that one of the greatest advantages in the use of these tanks is that the tanks do not require to be painted in order to be kept in good condition. It is rather expensive to scrape off the old paint, repaint and lacquer tanks, whether of iron or aluminum, and therefore, though the rustless steel tanks are more expensive, they are cheaper in the long run, as they do not require the constant upkeep by painting and

lacquering. Another advantage is that storage and railroad tanks and fermentation vats can be fabricated in any size greatly exceeding the limit for enameled vessels, which is about 9000 gal. for tanks enameled in one piece. An accompanying picture shows part of the 80 rustless steel storage tanks in a Danish brewery. [Views of a large rustless steel vat in a fermenting cellar and an installation of rustless steel storage tanks were given in THE IRON AGE of March 23.]

New Air Conditioner Has Unique Features

THE De La Vergne Engine Co. announces a new self-contained air conditioning unit which has several unique features.

This device operates entirely by electricity; is air-cooled, and requires no piping whatever, either for water or refrigerant.

The unit employs the proven compression-refrigeration cycle for cooling and dehumidifying, and the new De La Vergne reverse refrigeration principle for warming and humidifying. To change it from a cooling unit to a heating unit requires only the turning of a lever. The safest refrigerant known, namely Freon or F_2 , is used in a sealed compressor charged at the factory and requiring no further attention on the part of the owner.

The device is housed in a cabinet designed to harmonize with its surroundings, the installation of which is simple and inexpensive, requiring only an electrical outlet sufficient to carry 2 k.w. of electrical energy, and air ducts arranged under a partially raised window sash. Thus the unit is not permanently attached to the building and can be easily moved from one room to another as required. Where window space is not available it is possible to install ducts to outside air in numerous ways, depending upon conditions.

All of the essentials of complete year-round air conditioning are claimed.

The compressor used in the new conditioner is a two-cylinder opposed vertical shaft unit directly connected to vertical motor, totally inclosed in the machine. It is driven by a 2-hp. motor and has a refrigerating capac-

ity equivalent to $1\frac{1}{2}$ tons ice meltage per 24 hr., or 18,000 B.t.u. per hour.

One unit in a room of approximately 5000 cu. ft. is capable of effecting a reduction in temperature of from 10 to 15 deg. F., with an equivalent reduction in relative humidity when used as a cooling unit, or conversely will raise both temperature and relative humidity when used as a heater. Multiple units may be installed to conform to the size and conditions of the space to be treated.

This equipment is the product of a year's development and the first units



have been under test in a "weather" room for the past six months to observe operating conditions.

Selling operations for this air conditioning unit will head up through Harry C. Grubbs, with headquarters at Eddystone, Pa. Mr. Grubbs was formerly commercial vice-president of the Victor Talking Machine Co. and later vice-president in charge of sales for the R.C.A. Victor Corp.

New Gas Furnace Control Records Volume

The Pittsburgh Equitable Meter Co., Pittsburgh, has developed a new unit for industrial gas furnaces, which performs in a single installation the functions of burner pressure control, flow indication and volume measurement.

Known as the "Emco" system of pressure control and volume measurement, this unit consists of a combination of a remote controlled pressure regulator and single pen indicating orifice meter equipped with square root chart.

The regulator, through a pressure tap directly to the burner manifold, maintains a constant pressure at the manifold, regardless of the number of burners lit. The simplified orifice meter is provided with an indicating scale, over which the pen arm describes an arc and indicates the rate of flow expressed in cubic feet per hour. The operator, by glancing at the scale, can determine instantly the amount of gas being used by the furnace at any time. A continuous chart record is made by the meter which may be easily computed to arrive at the actual volume of gas used during any given period.

Steel Industry Faces Growing Scrap

A PERMANENT shortage of steel scrap for remelting appears to be a more than probable reality of the not distant future.

To estimate when this condition will occur, or its proportions, requires reasonable correctness in the assumption of three major premises; two of these are deduced from scanty statistics and the third is a projection into the future of the trends of the past. Temporary scrap shortages which are the natural result of a rapidly accelerated rate of ingot production must not be confused with the long-time trend, because such passing conditions merely represent the lag in time between the manufacture for replacement and the return of the replaced to remelting availability.

The assumptions upon which this study is based are:

- 1—That 65 per cent of the ingot will be returned for remelting.
- 2—That 20 per cent of the Bessemer and 25 per cent of the open-hearth ingot represent plant scrap made in the ingot producing plant and immediately available. That 15 per cent is fabricating scrap and articles of consumption which will be available evenly over a 10-year period. That 25 per cent will be available from permanent construction over a period of 30 years, beginning 10 years after ingot production.
- 3—That the future rate of steel produc-

tion is: 1933, 15,000,000 tons; 1934, 20,000,000 tons; 1935, 30,000,000 tons; 1936, 40,000,000 tons; 1937, 45,000,000 tons; 1938, 50,000,000 tons. Then a uniform increase of 500,000 tons per year.

The proportion of steel scrap in the charge has been continued as of 1929 instead of adopting the present tendency toward higher percentages. The 1929 proportion does not, however, represent the limit of metallurgical economy to which scrap could be utilized, were it available.

A fairly accurate estimate of the production and consumption of steel scrap within the steel mills themselves can be arrived at from statistics of production by the various processes and a knowledge of the requirements of these processes. All requirements, when expressed in percentages, are based on ingots. Charge weights are about 10 per cent higher than ingot weights, so that a 50 per cent scrap charge, in terms of charge, would be 55 per cent in terms of ingots.

The amount of scrap which could be made available from sources outside of the ingot producing plants is subject to greater error in estimating because statistics do not exist. Even export and import figures fail to differentiate between articles of iron and steel. The changing nature of the distribution of steel products

into classes which would affect the expected return as scrap, the unsolved problem of automobile and alloy steel scrap, and the shipment of steel into districts too remote for the return of scrap—these are considerations making an accurate estimate of the amount collectible from outside sources as a matter of considerable chance.

Beginning with the year 1886 and tabulating according to assumption No. 2, the scrap to be expected from sources other than plant scrap for any year is the sum of the parts of the ingot production of previous years allotted to that year. From this sum is deducted the part of steel exports allotted to that year and also the total scrap export tonnage for the year. (The author has deposited with THE IRON AGE his sheets of calculations for reference by anyone who would like to check the figures in detail.)

Scrap from outside sources is not returned for remelting at the uniform rate indicated by the tabulation. The return for any year would be largely determined by the state of industrial activity. A cumulative balance, however, between total scrap available and total requirements should indicate the condition of any possible reserves, and over an extended period should indicate any trend.

The results of this study are best shown graphically.

Chart I is informative only. It shows the excess or shortage of plant scrap for the Bessemer and open-hearth processes and for different proportions of product when both processes are employed. A 100 per cent Bessemer operation produces 15.5 per cent excess scrap, a 100 per cent open-hearth operation requires 32.5 per cent more scrap than it produces.

Chart II shows the per cent of the total ingot production made by the Bessemer and open-hearth processes for each year from 1886, and the assumption of the future upon which this is based.

Chart III shows the tonnage of steel for each of these years and the process by which it was made.

Chart IV is the yearly requirement and available supply of scrap in terms of per cent of ingots produced. The future proportional scrap requirement is based upon a continuation of the 1929-30 practice. Plant requirements of scrap exceeded plant production of scrap for the first time about 1902, while requirements exceeded the available allotment for the

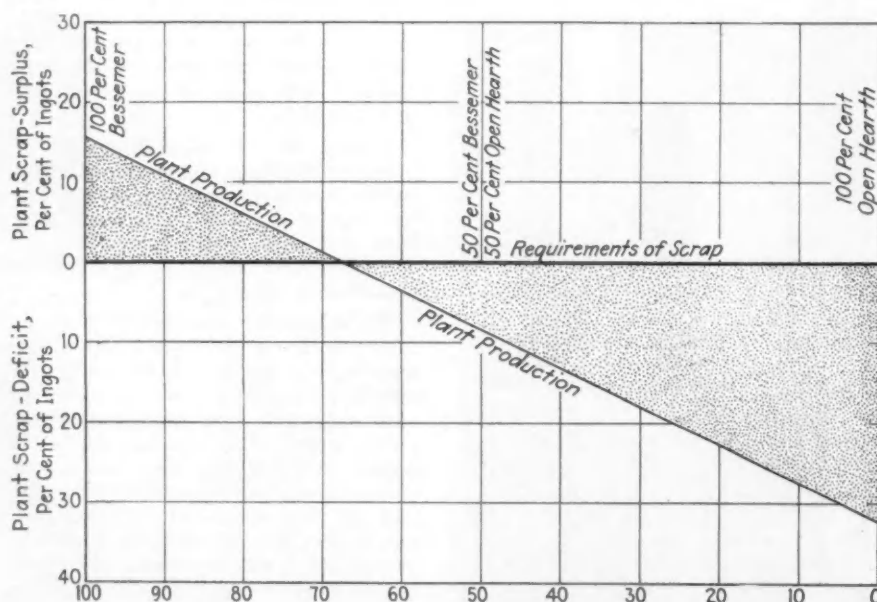


CHART I—As steel production changes from 100 per cent Bessemer to 100 per cent open-hearth, there is a change from the condition in which the plant makes more scrap than it can use to the case in which the plant needs far more than it produces. A plant of, say, 67½ per cent Bessemer and 32½ per cent open-hearth would be self-sufficient as to scrap requirements.

Scrap Scarcity

By LEWIS B. LINDEMUTH
Chrysler Building, New York

first time in 1915. The peaks of available scrap for the years 1908, 1921, and 1932 are a result of the method of calculation and caused by low ingot production and the assumption of a uniform rate of return of outside scrap.

Chart V is the cumulative balance of total scrap available and total plant requirements. It indicates that during the era when the Bessemer process was the principal producer a

steel scrap than we have become accustomed to consider normal, we must expect, both economically and metallurgically, changes in the operation of the open-hearth process. Heavy melting steel scrap can permanently approximate in price basic pig iron and the differentials for the cheaper grades of scrap should diminish. Scrap shortage must be made up by increased use of pig iron, but pig iron and steel scrap are not interchange-

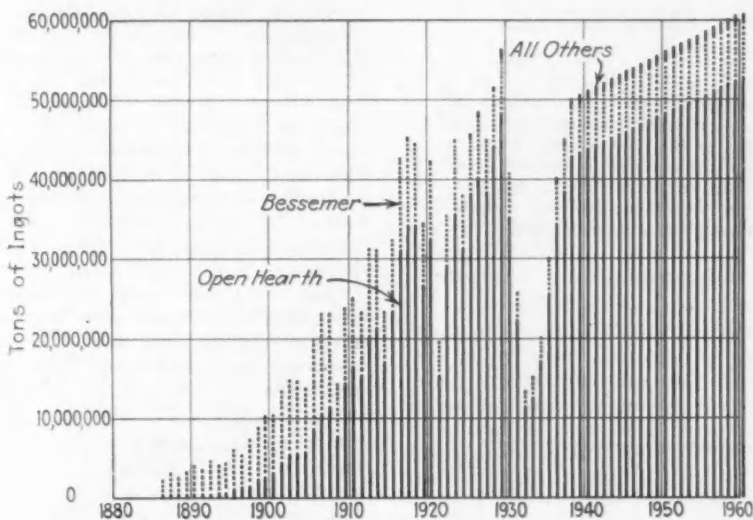


CHART III—To the graphical record of steel ingot production since 1885, showing the relative amounts made by the Bessemer, open-hearth and other processes, has been added an assumed expansion for 25 yr. or more, thus to estimate the statistical position of scrap in the course of the next several years.

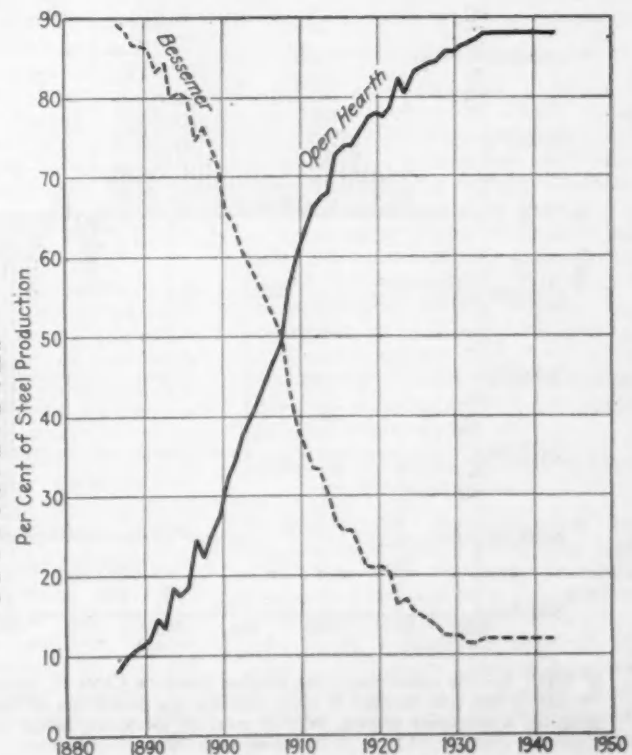
potential reserve of more than 37,000,000 tons of steel scrap was built up between the years of 1886 and 1915. An increasingly rapid depletion of this reserve took place from that time to the present, interrupted only by the low ingot tonnage of the so-called 1921 business depression, and now that surplus no longer exists. If this be so, to continue our present practice will no longer be possible.

This is based upon the whole steel-producing industry collectively, and therefore implies uniformity of distribution, obviously an impossibility. Locally the actual shortage in some districts can be much more acute, while in other districts there could be an indefinite surplus.

A more rapid rise from present low ingot production would intensify the indicated condition.

If we are to have permanently less

CHART II—Here is the picture of the rapid expansion in the past 47 yr. of the proportion of the total that is represented by open-hearth steel and the corresponding fall in the share that has been the Bessemer product, with stationary relations assumed for the early future for purposes of calculating scrap needs.



OWING to the proportionately large amount of scrap that can be used in the open-hearth furnace and the rapid expansion in production that has marked the growth of the industry, the author believes any close return to the scale of operations of the 1920's would develop a definite shortage in old material, because much of the steel of recent manufacture is still in useful service. He emphasizes, however, that the statistical approach is at best a wide estimate and that a mathematical basis of calculation may seem utterly impractical, but feels sure the question is important enough to merit serious study.

The article rounds out the two by the author in *THE IRON AGE* of Aug. 18 and 25, 1932, describing in detail the composition of charges for the basic open-hearth furnace.

able at will. Any appreciable departure from the best metallurgical procedure creates a hardship in both increased cost of ingots and lowered unit production, with the exception of the duplex process, where resources of materials and equipment permit its use. The latter process, with a regulated proportional production, could maintain an economic



CHART IV—Until 1902, the scrap produced in the steel plant more than sufficed for steel-making needs, so that there was a yearly excess of suitable old material piling up in the fields of consumption. With the ascendancy of the open-hearth process, a draft on the outside supply began. About 1915 the year's fresh supply of available scrap was about equal to the year's needs of such. Since then, except in times of low production, as in 1921 and in the last three years, each year's contribution of old material had been deficient, with an indicated annual shortage on and after 1935.

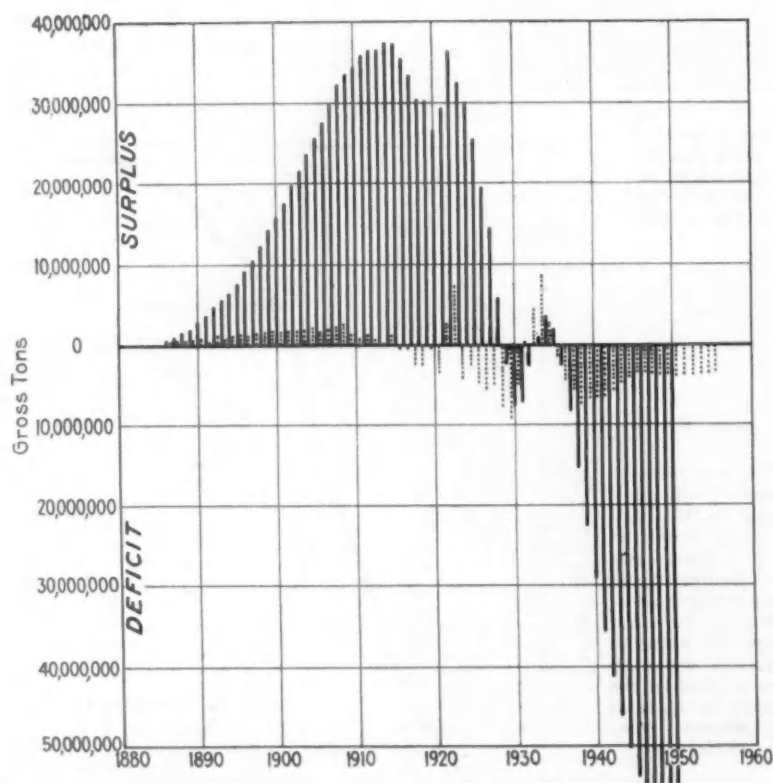


CHART V—The cumulative scrap reserve, based on Chart IV, shows that an indicated deficit was first reached in 1929, that the low production of the present period has produced a temporary surplus, but that a rapidly increasing deficit is the outlook beginning with 1936.

scrap balance for the regular process.

More than ever before the desirability for securing the maximum effectiveness of scrap becomes apparent, and in some cases imperative. Iron scrap must not be confused with steel scrap. Iron scrap is not interchangeable with steel for open-hearth remelting. When used, it substitutes for pig iron. Nothing in this study relates to iron scrap. Steel scrap is not a commodity of any production process, and therefore is in this respect unique. That a substitute might some time be manufactured in the form of a low-carbon ferrous product is not improbable.

Will Exhibit Special Testing Apparatus

Special testing equipment developed by research laboratories and committees of the American Society for Testing Materials will be displayed under the auspices of the society at the Stevens Hotel, Chicago, in the week of June 26, in connection with the meeting which the society will hold at Chicago at that time. Manufacturers of testing and related equipment will sponsor displays which emphasize new apparatus as well as improvements in the more standard types. In these booths will be found equipment for tests and studies of metals, cement and concrete, petroleum products and other engineering materials.

The committees which are planning to participate include A-10, on iron-chromium, iron-chromium-nickel and related alloys; B-4 on electrical-heating, electrical-resistance and electric-furnace alloys; and D-9 on electrical insulating materials. There will be shown apparatus and a method for corrosion testing by means of the acid and salt spray solutions; and apparatus for determining properties of thermostatic metals under load and temperature.

There will be a machine to test the soundness of welded pipe joints and apparatus for the testing of foundry cores. One of the instruments to be demonstrated magnifies the contour of ground, bored and other machined surfaces 2000 times. Wind meters, lathe dynamometers and other special devices will be on exhibit. An automatic photographic device will be shown. Included in the non-commercial exhibitors are the University of Michigan, Ohio State University and the Bureau of Standards of Los Angeles.

The exhibit will open Monday noon, June 26, and extend through Friday, June 30. Companies which will display equipment include: Baldwin-Southwark Corp., Christian Becker, Inc., Central Scientific Co., E. H. Sargent & Co., Precision Scientific Co., C. J. Tagliabue Mfg. Co. and Wilson Mechanical Instrument Co.

Barrel Plating of Zinc With Nickel

THE successful nickel plating of zinc in a barrel, according to Albert Hirsch, of the Carey-McFall Co., Philadelphia, depends on the preliminary preparation of the zinc surface, whether or not it is copper plated before being nickel plated and on the composition and the pH, or index of acidity, of the nickel plating solution. In a paper contributed to the Montreal meeting of the Electrochemical Society he described the successful application of barrel plating of zinc, as follows:

The method of barrel plating of small zinc parts on a production basis of about 12,000 parts a day covered: (1) dry grinding, (2) cleaning, (3) copper plating, (4) ball burnishing, (5) cleaning, and finally (6) nickel plating.

Preparation of the Zinc Surface.—The zinc surface is prepared by a process which the author terms "dry grinding." This consists of subjecting the fabricated zinc parts, as they come from the press covered with grease and drawing compound, to a process of grinding in a horizontal barrel charged with a mixture of maplewood sawdust and powdered pumice stone. The barrel is rotated at 30 r.p.m. for 5 hr. and the grease from the metal parts combines with the hardwood sawdust and pumice. The grinding removes all burrs left by the press operation and oxide film, and also slightly roughens the surface of the zinc.

Cleaning.—As practically all of the grease and oil has been removed in the grinding process, final cleaning is accomplished in baskets with a weak alkaline solution of the following composition: Na_2CO_3 , 4 oz. per gal.; Na_2PO_4 , 4 oz. per gal., and NaOH , 2 oz. per gal.

Copper Plating.—After rinsing in clear cold water the parts are barrel plated in a cyanide copper solution of the following formula: CuCN , 3.0 oz. per gal., and NaCN , 4.5 oz. per gal.

The parts are copper plated $\frac{1}{2}$ hr. at 140 to 170 deg. F., using 12 volts and a current of 400 amp. per load (approx. 4 amp. per sq. ft.). This gives a copper deposit approximately equal to 0.2 oz. per sq. ft. of surface, which is thick enough to prevent entire diffusion of the copper into the zinc with the subsequent blistering of the nickel deposit.

Ball Burnishing.—The copper plated zinc parts are then ball-burnished for 20 min. in a burnishing barrel charged with $\frac{7}{32}$ in. steel diagonals and a burnishing soap.

Nickel Plating.—After the ball burnisher, the copper plated zinc parts

are cleaned in the weak alkaline cleaner again, rinsed in clean cold water and barrel plated in the following nickel solution:

	oz. per gal.
$\text{NiSO}_4 \cdot 7\text{H}_2\text{O}$	14-28
$\text{NiCl}_2 \cdot 6\text{H}_2\text{O}$	3-6
H_2BO_3	2
$\text{NaBO}_2 \cdot 4\text{H}_2\text{O}$	0.1
NH_4OH	4.5-9.0

Use of Chromium in Steel Castings Is Surveyed at A. F. L. Meeting

AN important paper before a session on steel castings at the annual convention of the American Foundrymen's Association in Chicago, June 20 to 23, was entitled, "Chromium in Steel Castings," by J. H. Critchett, vice-president, Union Carbide & Carbon Research Laboratories, Long Island City, N. Y.

In introducing the subject, the author emphasized the broadening field for alloy steel castings by showing with a chart that the output of such material has expanded from only 4 per cent of the total production of steel castings in 1921 to over 17 per cent in 1931, and gives indications of still further growth. The ever-increasing tempo of production and the consequent demand for machinery and structures capable of withstanding severe duty are among the reasons for the increasing importance of alloy steel castings. Better understanding of heat-treating problems and improved foundry equipment have also contributed to the increasing use of this type of castings.

Three Types of Chromium Steel Castings

The purpose of the paper is to present the case for chromium castings. Since the chrome steels grade from pure structural to corrosion-resistant, the subject is divided into three parts: castings containing 1 to 3 per cent Cr for structural parts, those having 4 to 7 per cent Cr for both structural and corrosion requirements, and the special high-chromium corrosion-resistant steels.

In the 1 to 3 per cent Cr steel castings, physical properties are cited which show what can be expected from plain carbon steel heat treated for the best combination of strength and ductility. It is also brought out that by dropping the carbon slightly and adding small amounts of chro-

The figures for the amount of NH_4OH in the formula are approximate. The NH_4OH is added to produce a pH of 7.6 to 8.0, determined colorimetrically using phenol red as an indicator.

The parts are nickel plated for an hour using 6 to 12 volts, with a current of 200 to 400 amp. per load (giving a current density of approximately 4 amp. per sq. ft.), at a temperature of about 90 to 140 deg. F. The nickel deposit is approximately equal to 0.36 oz. per sq. ft. of surface at the higher current density. The nickel plated parts are then finally ball-burnished to a high lustre.

mium, both strength and ductility are raised. Better results are obtainable by considering the alloy combination first and adjusting the carbon to give the desired results, thus insuring maximum ductility by the simplest heat treatments. The excellent properties obtainable from the Cromansil type for castings are emphasized.

Properties which are creating a new market for the 4 to 7 per cent Cr steels as castings, as revealed by a table, are: Strength at moderate temperature, noticeable increase in corrosion resistance, and resistance to scaling at moderate temperature. Short-time tests indicate a creep strength in excess of 20,000 lb. per sq. in. at 800 deg. F. Tests are cited showing the high corrosion resistance.

Beneficial Effect of Titanium

The effect of titanium additions to the 4 to 6 per cent Cr steels is outlined. Without titanium these steels have very low elongation and reduction of area under certain conditions of cooling. Addition of titanium up to 1 per cent almost entirely eliminates the air-hardening property imparted by chromium, making the steels relatively ductile as cast. Simple reheating to about 1650 deg. F. with slow cooling still further increases the ductility and toughness to values comparable with low-carbon ordinary steel castings.

Effect of Nitrogen on 20 Per Cent Chromium Steel

Besides the high-corrosion and heat-resisting qualities of the high-chromium steel castings, particular attention is drawn to a new development—the introduction of nitrogen into steels containing over 20 per cent Cr. Nitrogen is added by means of a special high-nitrogen ferrochrome, and it must be present in the final steel to the extent of one part

for every 100 of chromium. This increases the strength and toughness very materially and the hardness only slightly, but without detrimental effect on machinability. The particular value of nitrogen additions, however, is in very greatly decreasing grain size, with consequent increase in toughness.

In one of the tables a 24 per cent

Cr steel with 0.22 per cent N has an ultimate strength of 106,000 lb. per sq. in. and yield point of 71,000 lb., with 12 per cent elongation and 12 per cent reduction of area. A steel of similar composition but only 0.05 per cent N had a tensile strength of 84,000 lb. per sq. in., a yield point of 52,000 lb., with only 7 per cent elongation and 7 per cent reduction of area.

chromium, the lowest being 2.5 per cent and the highest 12.5 per cent. There was an almost progressive increase in Brinell hardness as the chromium rose, the range being from 168 to 223. The properties of the regular malleable iron for comparison are given as: Tensile strength, 54,500 lb. per sq. in.; elastic limit, 37,500 lb. per sq. in.; elongation in 2 in., 18.5 per cent, with a Brinell of 131.

Tensile Strength Increased Materially

A good share of the author's discussion relates in detail to the effect of the alloy additions on the tensile strength, elastic limit, elongation and hardness. Photomicrographs reveal the effect of these additions on the structure. In general, says the author, additions of chromium and silicon in the ladle to standard malleable base mixtures change the structure of the annealed malleable so as to decrease the ferrite, refine the temper carbon and cause a pearlitic structure. The tensile strength of chromium-silicon malleable iron is from 10,000 to 25,000 lb. per sq. in. more than that of ordinary malleable iron, which is generally given as 55,000 lb. per sq. in.

The paper is offered as a progress report with the possibility of new fields of investigation. Possible uses for this type of malleable will occur to any malleable executive. The combination of high strengths, unusually high elastic limit, reasonable ductility and a hard wear-resistant matrix, all at moderate cost, offers a metal which can be of great service in many fields, the author believes.

Alloy Malleable Iron Excels in Strength and Wear Resistance

OF decided interest to the malleable iron castings industry is a paper, "High-Strength and Wear-Resistant Malleable Cast Iron," presented at a session on malleable castings by Miss Rebecca Hall, metallurgist, Chicago, at the annual convention of the American Foundrymen's Association, Chicago, June 20 to 23. The author is from Nashville, Tenn., and is said to be the first woman to present a technical paper before the A.F.A.

The paper states the results of an endeavor to develop a wear-resistant malleable iron having higher physical properties than the regular commercial product. This has been accomplished by chromium additions plus silicon control. The results are based on work done on a commercial scale in a regular foundry and not on experimental laboratory researches. There has been a contention that chromium acts as a poison in malleable iron. This theory has evidently been exploded by the author's work. Also the prejudice against alloy additions which has been claimed to inhibit or promote graphitization, in either case affecting the annealing process, has been overcome.

Although the relationship between Brinell hardness and wear resistance is in many cases controversial, Brinell numbers for the purposes of investigation may be fairly considered as an accurate measure of wear resistance. These are used by the author throughout the investigation.

Chromium and Silicon Added

Chromium was added to raise the hardness and strength, and silicon additions were made to counteract the inhibiting effect of chromium in the annealing process. For years, chromium has been taboo to the malleable foundryman because of this effect. Without additions of a graphitizing element such as nickel or silicon, chromium is very dangerous, says Miss Hall, in amounts over 0.07 per cent, but silicon will counteract the effect of chromium since it increases softness and favors formation of temper carbon.

Chromium was added in amounts from 0.25 to 1.15 per cent with

enough silicon to counteract its tendency to form stable carbides which might prevent the annealing operation. Earlier work indicated in a general way the amount of silicon necessary for this purpose, but two different percentages of silicon were added for each percentage of chromium to give more data on this ratio. Ferrochromium (64.55 per cent Cr), ferrosilicon (90 per cent Si) and, in one case, zirconium-manganese-silicon (21.78 per cent Zr) were used.

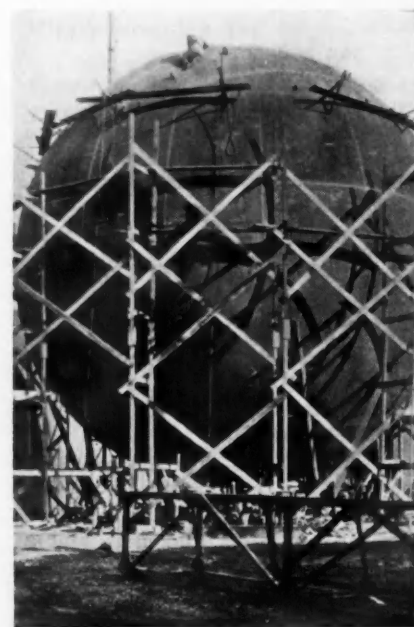
A table gives physical data on 14 heats compared with a standard unalloyed malleable iron. Chromium additions ranged from 0.22 to 1.15 per cent, with the silicon varying from 1.02 to 2.02 per cent. The lowest tensile strength was 67,000 lb. per sq. in. and the lowest elastic limit was 41,000 lb. Maximum tensile strength (80,500 lb.) was reached with 0.56 per cent Cr and 1.39 per cent Si. Brinell was 201. Elongations decreased with the increase in

Spherical Tank Built By Welding

RECENTLY completed by the Chicago Bridge & Iron Works for the St. Louis County Gas Co., at Shrewsbury, Mo., this spherical-type tank, known as the Hortonsphere, will be used for mixing gas. It is 45 ft. in diameter and has capacity for 162,000 cu. ft. of gas at 50-lb. per sq. in. working pressure.

The tank was welded in the field. The shell plates were first dished and the edges prepared in the shop, then matched marked and shipped for erection. In the field, the plates were hoisted into position by a derrick and then tack welded. The welders then went over all the seams, using four beads on each joint. Each bead was thoroughly cleaned and peened before depositing the succeeding bead. Upon completion, the tank was given a soap-suds test at 70 lb. air pressure; no leaks were discovered. The welding totaled 5024 lineal ft. and was completed in approximately 14 days.

The shielded arc process, with equipment manufactured by the Lincoln Electric Co., Cleveland, was employed.



Two New British Cast Irons Have Heat-Resisting Properties

TWO new British cast irons won attention at one of the gray iron sessions of the annual convention of the American Foundrymen's Association in Chicago, June 20 to 23. Their properties were detailed in a paper entitled "Silal and Nicrosilal Heat-Resisting Cast Irons," by A. L. Norbury and E. Morgan of the British Cast Iron Research Association, Birmingham, England.

Silal is a gray cast iron containing for most purposes about 5 per cent silicon and 2.5 per cent total carbon, with a fine graphite structure. The increased silicon greatly augments re-

sistance to oxidation, say the authors, and the iron gives much better service than the best low-silicon irons for purposes such as fire-bars, furnace parts, etc., at temperatures up to about 850 deg. C. (1562 deg. F.).

Nicrosilal is an austenitic gray cast iron, similar in certain respects to Niresist (International Nickel Co.), containing for most purposes about 2 per cent total carbon, 5 per cent Si, 1 per cent Mn, 18 per cent Ni, and 2 to 5 per cent Cr. The iron is extremely ductile and tough, in spite of its high silicon, which increases resistance to oxidation as in

the case of Silal. The oxidation resistance is further increased by the chromium content, so that even at 950 deg. C. (1742 deg. F.) scaling only proceeds very slowly with growth practically nothing. The iron is easily machinable, takes a fine finish and is non-magnetic.

Particular attention is called to the malleabilizing properties of Nicrosilal. This iron may be cast white by using a sufficiently low total carbon content (which is about 1.8 per cent in 1/10-in. thick castings) and then malleabilizing by heating for about 1/2 hr. at 950 deg. C. (1742 deg. F.), whereby a ductility is obtained comparable with that of malleable iron. White iron produced by a raised chromium content does not graphitize in this way.

Special properties of the two irons are discussed in the paper.

Thermostat Protects Against Excessive Motor Temperatures

EXCESSIVE motor temperature caused by continued overloads or from stalling is prevented by thermal devices used with a well-made starter or controller. These thermal devices, however, do not afford protection where a motor may overheat from too frequent starting, reversing or recurring peak loads or obstructed ventilation. The thermal device on the starter cools quickly between periods of low or subnormal loads but the temperature of the motor continues to increase until a destructive temperature exists.

Consider a steel mill motor installed near the path of hot metal going through its cycles of starting and reversing. Add to this the abnormal

load of an occasional tight roller bearing. True the motor may be insulated with material designed to withstand a temperature. But how can the limit of safe operating temperature be controlled? The protective device located in the comparative cool of the control room will not give an indication. If a dashpot type overload relay is used the piston resets quickly after each pass. If a thermal overload relay is used it becomes warm with each surge of current and then cools off, but the motor does not cool quickly between surges. The heat is, therefore, cumulative and the possibilities are that the motor will become dangerously overheated. The thermal overload relay is an improvement over

the dashpot relay in an application of this kind because it does not reset instantly and it will cause the motor to be disconnected from the line if it stalls.

To guard against these and other hazards, such as the effect of low voltage, Westinghouse Electric & Mfg. Co. have developed a thermostat built into the motor which gives complete protection against excessive temperatures. Where uninterrupted operation is required, the thermostat instead of disconnecting the motor, merely operates an audible or visible signal when dangerous motor temperatures are approached.

The customary external thermal relay protects the motor against failure to start, or if it stalls, while the thermostat prevents the motor from reaching a dangerous temperature. This combination provides complete protection.



Installing the thermostat on a totally inclosed fan-cooled motor



D.C. motors use a thermostat fastened to the interpole winding

Fabricated Structural Steel

Awards in Good Volume—New Projects Higher

WITH the exception of the first week in May, when awards were made for the San Francisco-Oakland bridge, lettings the past week, at 22,800 tons, are the largest since early in February. The outstanding award is 12,000 tons for the Rip Van Winkle bridge at Catskill, N. Y. New projects of 7000 tons compare with 3950 tons in the previous week and 5950 tons two weeks ago. The largest new job reported is 2500 tons for the Lebanon Hospital in New York. Plate awards bulk large, totaling 19,700 tons. Structural steel awards for the week follow:

NORTH ATLANTIC STATES

Greenville, Me., 250 tons, school, to McClintic-Marshall Corp.

New York, 490 tons, for 650 Madison Avenue Building, to George A. Just Co.

Yonkers, N. Y., 380 tons, St. Joseph's Hospital, to Shippers Car Line Corp.

Catskill, N. Y., 12,000 tons, Rip Van Winkle bridge, to Harris Structural Steel Co.; Frederick Snare Corp., general contractor.

Wilmington, N. Y., 325 tons, grade and high school, to Leach Steel Co.

Lancaster, Pa., 130 tons, beam framing for sewage plant, to A. B. Rote Co.

Baltimore, 280 tons, boiler house for Baltimore City Hospital, to Dietrich Brothers.

THE SOUTH

San Antonio, Tex., 100 tons, bridge for Missouri-Kansas-Texas Railroad, to American Bridge Co.

Corpus Christi, Tex., 2000 tons, building for subsidiary of Columbia Chemical Co., division Pittsburgh Plate Glass Co., Barberton, Ohio; portion of steel placed with Houston Structural Steel Co.

CENTRAL STATES

Columbus, Ohio, 147 tons, Wagner Brewing Co., to Truscon Steel Co.

Cincinnati, 600 tons, Chesapeake & Ohio Railroad bridge, to Jones & Laughlin Steel Corp.

Gary, Ind., 1000 tons, American Sheet & Tin Plate Co., to American Bridge Co.

Detroit, 320 tons, grade separation for Michigan Central, to R. C. Mahon Co., Detroit.

Seneca, Ill., 180 tons, piling for Rock Island Railroad bridge, to Inland Steel Co.

Manitowoc, Wis., 100 tons, dock, to Inland Steel Co.

Missouri Pacific Railroad, 1760 tons, beam spans, to American Bridge Co.

WESTERN STATES

Madrone and Station Junction, Cal., 250 tons, viaducts for Southern Pacific Railroad, to McClintic-Marshall Corp.

Olympia, Wash., 100 tons, brewery, to Isaacson Iron Works.

San Francisco, 300 tons, derricks for San Francisco-Oakland bridge, to Isaacson Iron Works.

San Francisco, 170 tons, East Bay sub-structure on San Francisco-Oakland bridge, to Moore Dry Dock Co.

San Francisco, 2300 tons, caissons for West Bay sub-structure on San Francisco-Oakland bridge, to Moore Dry Dock Co.

San Francisco, 800 tons, stiff leg derricks for Weber & Co., to McKiernan-Terry Corp.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

Bethel, Me., 100 tons, academy.

New York, 2500 tons, Lebanon Hospital; Charles B. Meyers, New York, architect.

New York, 15,000 tons, viaduct for New York Central Railroad; bids postponed until June 27.

Brooklyn, 700 tons, bottling plant for Interboro Beverage Corp.

Wassaic, N. Y., 600 tons, State building.

Philadelphia, 290 tons, building for American Commercial Alcohol Co.

Philadelphia, 150 tons, building for Public Commercial Alcohol Co.

Baltimore, 275 tons, bottling house for National Brewing Co.

THE SOUTH

Norfolk, Va., 425 tons, Compostella bridge over Elizabeth River.

Houston, Tex., 1000 tons, passenger station for Southern Pacific Railroad.

CENTRAL STATES

Akron, Ohio, 125 tons, building for Akron Brewing Co.

Milwaukee Road, 150 tons, bridge at Golf, Ill.

WESTERN STATES

Oakland, Cal., 550 tons, Key System terminal; bids June 22.

Los Angeles, 150 tons, supplies for Metro-

politan Water District, six alternatives; bids under advisement.

FABRICATED PLATE

AWARDS

New York, 6000 tons, two freighters for Bull Steamship Line, Inc., to Newport News Ship Building & Dry Dock Co.

New York, 580 tons, tanks in Rhode Island and New York for Richfield Oil Corp. of New York, to Graver Tank & Mfg. Co.

Sharpsburg, Pa., 115 tons, brewery tanks for Fort Pitt Brewing Co., to Treadwell Engineering Co.

Lake Charles, La., 610 tons, tanks for Shell Petroleum Corp., to Chicago Bridge & Iron Works.

Orville, Ohio, 220 tons, elevated tank, to Pittsburgh-Des Moines Steel Co.

St. Louis, 100 tons, derrick boats for United States Engineers, to St. Louis Car Co.

Granite City, Ill., 150 tons, tanks for Granite City Brewery, to St. Louis Structural Steel Co., East St. Louis, Ill.

Helena, Mont., 100 tons, tanks, to Great Falls Iron Works.

Los Angeles, 4125 tons plates and 280 tons of ring girders, Bouquet Canyon dam inlet and outlet pipe, to Western Pipe & Steel Co.

Oakland, Cal., 100 tons, tanks, to California Steel Products Co.

Huntington Park, Cal., 100 tons, tank, to Chicago Bridge & Iron Works.

San Francisco, 500 tons, East Bay sub-structure on San Francisco-Oakland bridge, to Moore Dry Dock Co.

San Francisco, 7000 tons, caissons of West Bay sub-structure on San Francisco-Oakland bridge, to Moore Dry Dock Co.

NEW PROJECTS

New Bedford, Mass., 100 tons, brewery.

Denver, 290 tons, intake towers for Boulder Dam; bids under advisement.

Cincinnati, 135 tons, steel cylinders for Chesapeake & Ohio Railroad, to Dravo Contracting Co.

Reinforcing Steel

Awards 3900 Tons—New Projects, 3700 Tons

Catskill, N. Y., 1200 tons, bars and trusses for Rip Van Winkle Bridge, to Kalman Steel Corp.; Frederick Snare Corp., general contractor.

Coxsackie, N. Y., 215 tons, State school buildings, to Rawlins Co.; Amsterdam Building Co., general contractor.

Cleveland, 1240 tons, Parma Reservoir, to Patterson-Leitch Co.

Conneaut, Ohio, 140 tons, waterworks extension, to Patterson-Leitch Co.

Stanislaus and San Joaquin Counties, Cal., 145 tons, State highway bridge, to Pacific Coast Steel Corp.

Oakland, Cal., 135 tons, extension to outer harbor, to Soule Steel Co.

San Francisco, 125 tons, garage, to W. C. Hauck & Co.

San Francisco, 100 tons, printing plant, to W. S. Wettenhall Co.

State of California, 185 tons, paving and structures in Kern, Tulare and Los Angeles counties, to various bidders.

Panama Canal Zone, 379 tons, general work, to Jones & Laughlin Steel Corp.

NEW REINFORCING BAR PROJECTS

Brooklyn, 250 tons, warehouses for Interboro Beverage Corp.

Jones Beach, N. Y., 3000 tons, causeway; bids June 26.

Cleveland, 250 tons, garbage disposal plant; bids asked.

Los Angeles, 196 tons, Soto Street bridge over Pacific Electric Railway tracks.

Pipe Lines

Shell Petroleum Corp., Shell Building, St. Louis, will build crude oil steel pipe line from Iowa oil field district, La., to new tank farm about 10 miles south of Lake Charles, La., about 18 miles in all. Entire project will cost over \$200,000 with steel tanks, pumping machinery, etc., for storage and distributing plant.

General Purchasing Officer, Panama Canal, Washington, asks bids until July 10 for steel pipe, with alternative bids on iron pipe (Schedule 2880).

East Ohio Gas Co., 1405 East Sixth Street, Cleveland, plans 8-in. steel pipe gas line across Mahoning River, Weathersfield Township, Trumbull County, Ohio.

Mobile Gas Service Co., Mobile, Ala., has authorized installation of steel pipe lines for extensions in gas distributing system in different parts of city.

Texas Corp., Houston, Tex., plans steel pipe line from main trunk line of Great Lakes Pipe Line Co., in which interest recently has been secured, to refinery at West Tulsa, Okla., for gasoline transmission. Great Lakes line runs from Oklahoma to Chicago, Minneapolis and St. Paul, and has capacity of 30,000 bbl. daily.

Los Angeles let contract to Republic Steel Corp. for 50,000 ft. 1-in. steel pipe, for Boulder Canyon project.

Lake Charles, La., has awarded 1000 tons of 6-in. line pipe for Shell Petroleum Co., to Jones & Laughlin Steel Co.

Industry Gets Marching Orders From General Johnson

He Outlines Code Procedure and Calls for Quick Action
By the Ten Basic Industries

WASHINGTON, June 20.—Immediate submission of simple basic codes by the ten largest industries which include iron and steel and industrial machinery, was urged today by General Hugh S. Johnson of the National Recovery Administration, in a bulletin which announced that basic principles will guide it in considering codes of fair competition.

Emphasis was given to the fact that the Industrial Recovery program rests upon industry itself. It was pointed out that "it is not the function of the National Recovery Administration to prescribe what shall be in the codes—or to compel the organization of either industry or labor."

The bulletin says that basic codes "containing provisions respecting maximum hours of labor, minimum rates of pay and conditions of employment, which are in themselves satisfactory, will be subject to approval, although such conditions may not have been arrived at by collective bargaining."

Mention is made of penalty provisions of the law applicable to industries which fail to comply with it voluntarily.

Refrigerator Business Sets Westinghouse Record

Receiving more orders for refrigerators, in May, than in any previous month of its history, R. C. Cosgrove, manager of the refrigeration department of the Westinghouse Electric & Manufacturing Co., announces that the Mansfield, Ohio, works and the East Springfield, Mass., refrigeration division are now operating at capacity, 24 hr. a day.

Approximately 400 more workers are now on the payroll of the Westinghouse Mansfield works than were maintained during the war-time peak of employment, in 1918, due entirely to the electric refrigerator production.

Both the Mansfield and the East Springfield works are now operating a full 24 hr. daily to complete about 8800 back orders and to build a surplus to care for anticipated continuous demand during the next few months.

Mr. Cosgrove states that increased production has been caused not by any unusually large single orders but

The suggestion for quick submission of basic codes by the ten largest industries follows that made by President Roosevelt when he signed the law. These basic codes are to cover "only such agreements" to meet the three objectives of the act. They are maximum hours of labor, minimum rates of wages and "such means as each industry may find necessary to protect its constructive and co-operating majority from the wasteful and unfair competition of minorities or recalcitrants."

The bulletin suggests that the basic codes should propose "an average work week—designed so far as possible to provide such a spread of employment as will provide work for employees normally attached to the particular industry." It is also proposed that codes carry a minimum wage scale "sufficient in fact to provide a decent standard of living in the locality where the workers reside."

In order that increased wages shall not be offset by too rapidly rising prices, the bulletin provides broad protection to the public as consumers by a specific provision for representation at hearings.

from an abundance of small orders which shows a widespread buying trend from every part of the country.

Officers Nominated for Testing Materials Society

Nominations for officers of the American Society for Testing Materials for 1933-1934 have been announced. Official notice of election will be given on June 26, at the annual meeting, in Chicago, when the new officers will be introduced. Following is the slate: president, T. R. Lawson, department of civil engineering, Rensselaer Polytechnic Institute, Troy, N. Y.; vice-president, Hermann von Schrenk, consulting timber engineer, St. Louis, Mo.

Members of Executive Committee: Frank A. Barbour, consulting hydraulic and sanitary engineer, Boston; Arno C. Fieldner, chief engineer, experiment stations division, U. S. Bureau of Mines, Washington; C. N. Forrest, representative, the Barber Asphalt Co., Philadelphia; J. C. Pearson, director of research, Lehigh Port-

land Cement Co., Allentown, Pa.; A. E. White, professor of metallurgical engineering, and director, department of engineering research, University of Michigan, Ann Arbor, Mich.

Industries Asked to Defer Price Increases

General Johnson of the National Recovery Administration at a press conference June 20 said that the iron and steel industry is working as hard as it can on a basic code of fair competition. He stated that the entire industry will be included in codes. The basic code, he said, is being prepared by American Iron and Steel Institute.

General Johnson said "something in the nature of an armistice over building new capacity" will be asked of industries; it is also the intention of the administration to ask the basic industries to raise wages first and defer price increases. It is believed that other industries would then do likewise. Price advances would then become effective at a later date.

Trackwork Tonnage Lags

Production of trackwork, including special or fabricated switches, switch stands, frogs, crossings, guard rails and appurtenances, of carbon or manganese steel or other materials has been running at approximately half of the 1932 rate. This is for trackwork for 60 lb. rails or heavier, for domestic and export use, as reported to the American Iron and Steel Institute.

Comparisons by months for this year and comparison with corresponding months of preceding years are as follows, in net tons of 2000 lb.:

Months	1929	1930	1931	1932	1933
January	10,344	11,830	5,626	2,936	1,984
February	12,180	12,524	6,321	2,765	1,822
March	14,927	13,096	8,944	3,229	2,013
April	16,815	13,508	8,564	3,340	1,662
May	16,333	12,799	7,453	3,061	1,768

Empire Metal Merchants Adopt Code

A code of fair competition to govern the relations between scrap metal dealers, brokers and consumers, in the metropolitan district of New York, was presented by Benjamin Schwartz, trade relations counsel, at a meeting of the Empire Metal Merchants Association, held on June 15, and adopted by the members. One of the items provides that in consideration of the dealers selling their scrap metals through the brokers, the brokers have agreed not to compete with the dealers at their sources of supply, such as peddlers, automobile wreckers, etc.

Plate Fabricators Organize; To Draw Code of Practice

REPRESENTATIVES of 60 firms in the steel plate fabricating industry formed the Steel Plate Fabricators Association in a meeting at the Stevens Hotel in Chicago on June 15. The organization will proceed immediately to draw up a code of fair practice for operation under the Industrial Recovery Act.

The following officers were elected: president, Merle J. Trees, Chicago Bridge & Iron Works, Chicago; vice-president, W. H. Jackson, Pittsburgh-Des Moines Steel Co., Pittsburgh; treasurer, A. O. Miller, The Petroleum

Iron Works Co., Sharon, Pa.; directors, R. I. Ingalls, Birmingham Tank Co.; E. N. Cosselin, Graver Tank & Mfg. Corp.; Bryan Blackburn, R. D. Cole Mfg. Co.; W. F. Perkins, Bartlett-Hayward Co.; C. M. Denise, McClintic-Marshall Corp.; C. S. Patton, Alco Products, Inc.; H. A. Fitch, Kansas City Structural Steel Co.; V. P. Marran, Walsh Holyoke Steam Boiler Works; H. G. Tallerday, Western Pipe & Steel Co.; W. Taylor, Consolidated Steel Corp.; W. J. Wyatt, Wyatt Metal & Boiler Works; and L. A. Paddock, American Bridge Co.

Industrial Engineers to Meet In Chicago

Trends in management, effect of industry organization on the individual company, preparing sales departments for better business, and time and motion study technique are subjects planned for the annual convention of the Society of Industrial Engineers, to be held at the Hotel Stevens, Chicago, June 27-30.

The opening day will be devoted for the most part to conferences on education. Wednesday, June 28, will be spent at the Century of Progress Exposition, the morning program being sponsored jointly by several engineering societies. At a banquet in the evening, E. J. Mehren, president Portland Cement Association, will speak on "The Contribution of Engineering to Social Progress."

"Recent Tendencies and Developments in the Art of Management" will be outlined by J. D. Mooney, General Motors Export Corp., at the opening session June 29, which will be presided over by John M. Carmody, consulting engineer and president of the S.I.E. A progress report of the society's survey of industrial and economic conditions will be presented by Irving A. Berndt, vice-president Trundle Engineering Co., Cleveland. Expansion of S.I.E. activities will be discussed at the same session. Speakers at the annual dinner in the evening will include Turner W. Battle, assistant to the Secretary of Labor, Washington, on "Government and its Relation to Industry Today," and DeForest Manice, Stevenson, Jordan & Harrison, New York, on "Effect of Industry Organization on the Individual Company."

An address on "Grooming the Sales Department for Better Business," by F. B. Heitkamp, sales manager, Cincinnati Milling Machine Co., on the morning of June 30, will be discussed by Keith J. Evans, Joseph T. Ryerson & Sons, Inc., Chicago, and W. W. Nichols, D. P. Brown & Co., De-

troit. A comprehensive session has been arranged by the Society's time and motion study group, and in connection with it there will be a display of stop watches, time study boards, motion study clocks, and other equipment.

End of Scrap Yard "Sweatshops" Predicted

The elimination of the "sweatshop" scrap yard was predicted by Benjamin Schwartz, director general of the Institute of Scrap Iron and Steel, at a meeting of the Cleveland-Detroit Chapter, held at Cleveland, June 13. The adoption of a code of fair competition for the scrap iron industry to be considered at the annual convention of the Institute in Chicago during the week of July 3 will have to include provisions for minimum wages and other provisions governing the legitimate costs of operating a scrap yard, he stated, and will be enforced by both the Institute and the Government.

Economy Plan for U. S. Foreign Service

Chambers of Commerce and foreign trade groups of thirty cities have collaborated on a "plan of economy" for the Bureau of Foreign and Domestic Commerce which has been presented to President Roosevelt and Secretary Roper as a practical means of preserving the essential services of this Bureau to American business firms engaged in foreign trade.

The plan is the result of a three months' study initiated by fourteen trade associations in New York united in the Joint Committee for Foreign Trade Action.

An outstanding recommendation of the plan is the appointment of "Commercial Counselors" who would have charge of all commercial activities of the foreign services of the Depart-

ments of State and Commerce in each important trade region abroad. The post of Commercial Counselor would be a new one and would include many of the duties now performed by commercial attaches and consular officers. The Commercial Counselors would have a status in both Commerce and State Departments but their primary responsibility would be to the Department of Commerce.

May Structural Shipments Down

Structural steel shipments during May indicated a further radical slump in construction, according to American Institute of Steel Construction. This was due mainly to the complete cessation of public works. April bookings were approximately 45 per cent below March, and May bookings, according to the preliminary estimate, 34 per cent below April.

Cutler-Hammer Announ- ces Second Wage Increase

Cutler-Hammer, Inc., Milwaukee, has announced a 7 per cent raise in pay for 700 workers. This advance, in addition to one of 5 per cent, granted several weeks ago, restores one half of the last reduction made by the company.

Iron and Steel Employment Rose 5.6 Per Cent in May

WASHINGTON, June 20. — Employment in the iron and steel industry in May rose 5.6 per cent over that of April while the payroll increase was 23.1 per cent, according to the Bureau of Labor Statistics, Department of Labor. However, employment in May in the iron and steel industry was only 54.2 per cent of the average of 1926 while the payroll was shrunk to but 28.7 per cent of the 1926 average.

The increase in employment in all manufacturing industries in May was 4.8 per cent and the increase in the payroll was 11.5 per cent compared with April. The employment in May was 58.7 per cent of the average for 1926 while the payroll was 38.9 per cent of the wages paid in 1926.

Applies for Decrease in Tungsten Duties

WASHINGTON, June 20. — Application for a decrease in the duties on tungsten and ferrotungsten has been made to the Tariff Commission by the David Taylor Co., Inc., 52 Broadway, New York.

OFF THE ASSEMBLY LINE



Automobile Production Rises to Highest Point of Year

DETROIT, June 20.

THE automobile industry is in jubilant mood as it enters the final 10-day period of June with production at the highest point of the year. Many manufacturers have increased their operations and both Chevrolet and Chrysler are running some departments 24 hr. a day six days a week. Retail sales reports for the first half of the month indicate further expansion of demand in all parts of the country and no end is in sight of this almost unprecedented buying movement at this time of the year. Automobile executives view the Industrial Recovery Act as an instrument which can be effectively used to widen purchasing power. They feel that a general advance in wages will result almost immediately in a further broadening of their market; therefore they are contemplating the summer as a period of great activity entirely divorced from the traditional dullness ordinarily expected in July and August.

Adding 40,000 units for Ford to the 172,883 units assembled by members of the National Automobile Chamber of Commerce, total output of the industry in May was about 213,000 units. The June figure will be higher than that of May. Production schedules are so sensitive to retail sales that it is almost impossible to predict what will happen more than a week or two ahead. Nevertheless tentative plans for July call for 190,000 to 200,000 cars and some companies already are setting up preliminary schedules of relatively large volume for August. It is safe to assert that steel tonnage from the motor car industry will continue at or near its present pace through the entire month of July. No one is more astonished than the automobile people themselves at the fact that in several notable instances retail sales have been exceeding shipments from factories, despite the stiffest sort of a production pace.

There is scarcely a steel company which does not report bookings this month from the automotive industry considerably ahead of those in May.

In certain cases the gain amounts to 50 per cent or better, and the size of some orders is reminiscent of the palmy days of 1928 and 1929. Automobile makers are pressing mills for rush deliveries, with steel being trucked to southern Michigan in the shortest possible time to prevent production lines from shutting down temporarily. The bulk of the business placed by automotive users is for immediate requirements, but increased buying on the part of certain small consumers is partly of a speculative nature. One of the larger automobile manufacturers makes no secret of the fact that it is considering buying some steel before the month is out and laying it down against future needs. Most steel users are eager to get third quarter quotations, but have not yet succeeded. Even in this city, which is notorious for the lowest steel prices in the country, the price situation has lately become much stronger.

Industry to Insist on Open Shop

What course will be adopted by the automobile industry under the Industrial Recovery Act remains undetermined. The National Automobile Chamber of Commerce at its annual meeting last week appointed a committee to study the advisability of adopting a trade code and officials expressed a desire to cooperate with Washington in working out wages and hours satisfactory to the administration. It is believed that the industry can adapt itself without great difficulty to the new program, possibly putting into effect six-hour shifts in place of the present eight and nine-hour shifts. There are some problems, of course, to be worked out. The industry always has been free from the tentacles of labor unions and intends to remain so, insisting upon the continued application of the open shop. Then about 15 per cent of the factory labor consists of maintenance men, classed as non-productive labor. Their work is of such character that they may be busy for two hours one day and eleven hours the next. How to apply the short work day to this

group is a vexing question. Another problem to be considered is the fact that the automobile industry always has been a seasonal industry and, so far as executives can see ahead, always will be more or less of a seasonal nature. It is difficult, and probably undesirable to limit this seasonal bulge.

Chrysler Moves Up to Second Place

Chevrolet will make about 71,000 cars this month, and other divisions of General Motors should turn out 22,000 cars. Chrysler Corp. has a schedule of about 55,000 units, thereby dislodging Ford from second position in the industry. Ford is manufacturing 2000 V-eights a day and several hundred fours. Campbell, Wyant & Cannon at Muskegon is casting about 400 V-eight cylinder blocks a day for the Ford Motor Co. Great Lakes Steel Corp. is operating all six of its open-hearth furnaces. The second blast furnace at Zug Island has been relined and now is producing hot metal for the Great Lakes open-hearths.

To take care of part of its expansion needs recently a prominent motor car company purchased used machine tools, even going so far as to buy some of them from a rival company which had dismantled one of its parts divisions. This brings into the foreground the large volume of used tools which automobile makers have for sale. One of the more important companies has a list of 7000 machines which it is trying to sell, and another maker has a still larger list. Each company has a man in charge of used equipment who is giving his entire time to trying to dispose of these tools, which range from obsolete machines classed in better times as junk to relatively modern tools. Despite this used machinery selling campaign, and the immense stocks of tools stored in warehouses of motor car companies, the machine tool trade is convinced that the automobile industry cannot get away from capital expenditures for new equipment when the tooling up for new models is started in the fall.

The recent purchases of used equipment cannot be considered in any other light than as stop-gaps to tide over the next few months. They are an indication of the fact that motor car makers once again are getting into a position in which they must invest in machinery and when permanent tooling up for 1934 cars is planned, they will be compelled to buy new tools for the sake of economy alone.

Automobile Executives to Consider Code

It is expected that automobile executives will meet in Detroit late this week to decide whether to formulate a code for the industry under the provisions of the Industrial Recovery Act. Manufacturers are of the opinion that the industry already has accomplished much of what the act aims to do, namely to spread work by shortening hours and to add to purchasing power by setting up minimum living wages. It claims to be one of the four best wage paying industries in the country. The industry has no intention of budging from its traditional open shop labor policy and it is significant that individual companies have not hastened, as some steel companies have done, to set up a system of employee representation. The general attitude seems to be one of watchful waiting with a distinct reluctance to do anything to disturb the present relatively satisfactory status of affairs within the industry.

Of course it is improbable that the administration will permit the industry to operate without a code if for no other reason than the damaging effect of making an exception of a key industry. Executives realize this but they are agreed that it would be unwise to rush through a code of trade practices rather than wait and see what is the best thing to do after the first fever of excitement has abated.

The industry is a unit in its desire to do everything possible to hasten recovery and to achieve this end it already has pledged to the Roosevelt administration its full cooperation and support. Without any type of compulsion one of the largest automotive industries pioneered on the eight-hour day, five day week and minimum wage at that time higher than the market rate.

One of the beneficial effects which the industry can visualize as possibly accruing from a trade practice agreement is the abolition of the troublesome method of quoting prices on an F.O.B. Detroit basis. Another is the stabilization of retail prices and possibly a horizontal increase as contrasted with the steady downward trend over a period of years.

One of the main factors which should lead to adoption of a trade code is the situation in the parts and accessories field where prices in some cases have been forced down to almost a starvation level because of pressure from certain automobile companies.

Code of Iron and Steel Industry Will Soon Be Completed

NEW YORK, June 19.—The final enactment of the National Recovery Act found the steel industry ready to give the new industrial control administration its hearty cooperation and well on the road to perfection of its internal organization. A code for the industry is now being prepared and should be ready for submission to Washington within a week.

This instrument will represent the combined ideas of from 90 to 95 per cent of the industry and, if acceptable to Washington and to the outside minority, should win quick adoption.

While it is certain that wage rates will be raised, the amount of the increase has not yet been decided upon but will be inserted in the code at a later date. Wage rates will not be uniform throughout the country but will vary geographically. Similarly, the question of hours of labor is still unsettled.

No steps have yet been taken toward concerted action on prices. While the law does not specifically authorize price fixing, it is the purpose of the act to prevent sales below cost. It has not yet been decided how costs will be ascertained, nor is it yet clear that the adoption of uniform cost accounting methods will be necessary. Allocation of tonnage has been taken into consideration as a possibility, but the present view is that it will not be required. It is hoped that neither allocation nor industry-wide investigation of costs will have to be resorted to.

The industry, which has always stood for the open shop, interprets the new law as permitting a continuance of direct dealings between companies and their employees. To facilitate such negotiations the industry as a whole will encourage the adoption of employee representation plans, such as have been in force at the Bethlehem Steel Corp., at the American Rolling Mill Co., and the Colorado Fuel & Iron Co. A plan of employee representation, similar to those previously in force among the companies mentioned, was adopted at the Carnegie Steel Co. plants last week. Undoubtedly similar action will be taken by employees of other subsidiaries of the Steel Corporation, as well as by employees of various independent companies.

The code which will be adopted by the industry will, it is understood, be binding on the small minority which has thus far failed to participate in the deliberations which have been held under the auspices of the American Iron and Steel Institute.

It is the belief of steel leaders that industries, under the new law, will be

largely self-governing and that interference by the Government will be restricted mainly to the adjudication of disputes that cannot be settled internally, the approval or amendment of codes and practices put into force, and to the handling of the relations between industries and the general public or specific groups of outside interests.

There is every prospect that the new code can be put into force within the next four or six weeks, depending of course upon its prompt acceptance at Washington.

Presumably the code will remain in effect for two years, as directed by the act, unless the President declares the emergency ended and suspends the operation of the law.

Steel For Ship Program

WASHINGTON, June 20.—Approximately 66,400 tons of plates, shapes and bars will be required for the 32-Naval ship program which will be undertaken under the authority of the Industrial Recovery act.

The tonnages are estimated as follows:

	Total	Plates	Shapes and Bars
Two aircraft carriers...	18,000	12,000	6,000
Four light cruisers....	28,000	18,500	9,500
Twenty destroyers.....	16,000	10,500	5,500
Four submarines.....	3,600	2,400	1,200
Two gunboats.....	800	525	275
	66,400	43,925	22,475

The total cost will be \$238,000,000. The construction will be distributed over a period of three years. It is proposed that \$46,000,000 will be available during the fiscal year 1934; \$105,000,000 during the fiscal year 1935 and \$87,000,000 during the third year.

The Secretary of the Navy declared that the Department will build to the fullest capacity of shipyard facilities as quickly as possible in order to put people to work at shipbuilding, where 85 per cent of the expenditures goes to labor.

Bids for ships under the Industrial Recovery Act for private yards will be taken July 26 and it may be possible to go ahead with construction by August, depending a great deal on tenders. The bulk of the ordinance will be made at the Washington Navy Yard.

Beech Grove Foundry Co. recently changed its name to Cook & Ewing Foundry Co. and is now operating in new quarters, 1260 Kentucky Avenue, Indianapolis, manufacturing brass and aluminum castings.

Washington Organizes for Business

WASHINGTON, June 20.—With the "government-business partnership" officially launched last Friday by President Roosevelt when he signed the Industry Recovery-Public Works Act, Washington is plunged deeply in a vigorous effort to hasten the return of prosperity. In an outspoken statement the President said that the "task is in two stages—first, to get many hundreds of thousands of the unemployed back on the pay roll by snowfall and, second, to plan for a better future for the longer pull."

Applying action to his words, the President announced two organizations to push the titanic effort ahead. One covers the Industry Recovery section of the law. The other covers the Public Works section, calling for an outlay of \$3,300,000,000 for public works and highway construction, the latter to cost \$400,000,000.

Heading the Industrial Recovery organization is General Hugh S. Johnson. Heading the Public Works organization is Colonel Donald H. Sawyer. Colonel Sawyer was selected as temporary administrator, to serve three weeks. Apparently it is the purpose of the President upon his return from a cruise the first week in July to name a permanent administrator of public works. It is reported that Colonel George R. Spalding of the Army Engineering Corps may be selected.

Administrator Johnson and Administrator Sawyer operate separately. Each operates with a special board. The Industrial Board consists of Secretary of Commerce Roper, chairman; Secretary of Labor Perkins, Attorney General Cummings, Secretary of the Interior Ickes, Secretary of Agriculture, Director of the Budget Douglas; chairman of the Federal Trade Commission and Administrator Johnson. Headquarters are in the Department of Commerce Building.

The Special Board on public works consists of the same cabinet members, Secretary Ickes, chairman; Director of the Budget Douglas and Administrator Sawyer. The Public Works organization has headquarters in the Navy Department Building.

Personnel of Advisory Boards

In addition to the general boards, which are made up of government officials, there is an Industrial Advisory Board composed of business men and industrialists and a Labor Advisory Board.

The Industrial Advisory Board is composed as follows:

Austin Finch of Thomasville, N. C., president Thomasville Chair Co. and

By **L. W. MOFFETT**

Resident Washington Editor, The Iron Age

chairman of a committee of the Southern Manufacturers Association appointed in connection with the National Industrial Recovery Act.

Edward N. Hurley of Chicago, chairman of the board Hurley Machine Co.

Louis Kirstein, vice-president William Filene's Sons Co., Boston.

Alfred P. Sloan, Jr. of New York, president General Motors Corp.

Walter C. Teagle of New York, chairman of the board Standard Oil Co. of New Jersey.



W. L. ALLEN
Steel Coordinator

Gerard Swope of New York, president General Electric Co.

William J. Vereen of Moultrie, Ga., cotton manufacturer and former president of the American Cotton Manufacturers Association.

The Labor Advisory Board has the following members:

Dr. Leo Wolman, economist of Columbia University, chairman.

John Frey, Metal Trades Department, American Federation of Labor.

Joseph Franklin, president International Boilermakers Union.

William H. Green, president of the American Federation of Labor.

Sidney Hillman, president Amalgamated Clothing Workers.

Father Francis Haas, Catholic Welfare Council.

Rose Schneiderman, secretary Woman's Trades Union League.

General Johnson has appointed a number of deputy administrators, who will assist him in conducting hearings regarding various codes to be submitted. The appointments thus far made are as follows:

W. L. Allen of New York, consulting metallurgist and former chairman of Sheffield Steel Co., as well as former director of American Rolling Mills Co.

Professor Earl D. Howard, Northwestern University, formerly executive secretary of the committee on industrial relations of the Chamber of Commerce of the United States, later vice-president of Hart Schaffner & Marx.

Arthur D. Whiteside, president of Dun & Bradstreet, Inc., New York.

C. C. Williams, retired Major General, former Chief of Ordnance during World War.

K. M. Simpson, consulting engineer and metallurgist, and president International Chromium Process Corp.

Nelson Slater, president of S. Slater & Sons, manufacturers of cotton and rayon textiles.

Public Works Will Call for 2,000,000 Tons of Steel

Though the Industry Recovery section is by far the more important from a point of employment, wages, purchasing power and production, the first notable impulse from the legislation probably will come from the Public Works section. The idea is to start at once with work under this section. It will see its initial movement in the highway construction program, which is to be started at once. Then comes the public building program which will be submitted to the President when he returns to Washington. Projects already have been studied. Those to lead all others will consist of postoffices and other federal buildings on which work was stopped as the result of the executive order of the President last March which transferred appropriations for public works to the reforestation project. Rough estimates have been made that the entire Public Works program, including semi-public projects, will involve more than 2,000,000 tons of steel.

It is the purpose of the President, he announced in his statement, to prevent pouring money into unproven projects. Plans for rushing public buildings throughout the country have been prepared with this end in view. Postmaster General Farley and Assistant Secretary of the Treasury L. W. Robert, Jr., have authorized architects to complete drawings for 62 projects, to cost \$25,000,000, ready to



C. C. WILLIAMS

be submitted for bids within 45 days. It is estimated they will involve about 20,000 tons of structural steel. Included in this list will be a postoffice on Vesey Street in New York, to cost \$5,715,000, requiring about 5500 tons of steel. Included in this list also will be a postoffice for St. Louis, costing \$4,275,000, requiring about 4000 tons of steel; a postoffice in Buffalo, \$1,500,000, requiring about 1500 tons of steel and a parcel-post building at Richmond, Va., \$610,000, requiring about 600 tons of steel. These projects will be followed by a second group of buildings, costing \$25,000,000, to be marketed in about 60 days and then another group, costing \$50,000,000, to be ready for bids in 90 days. Others will follow until the federal program is cleaned up.

In all there are some 10,000 building projects which have been prepared and it is the plan to proceed with them in rapid order once they are started. In the public works section also are many other projects, low-cost housing slum clearance, railroad grade crossing elimination, river and harbor improvements, hospitals, dry docks, reservoirs and pumping plants, naval vessels and aircraft. The Navy Department already has announced a program for the construction of 32 ships to cost \$238,000,000 and has recommended the construction of 290 naval planes to cost \$9,362,000. Some of the projects are of a semi-public nature for which money may be borrowed from the government.

Allen Will Be "Metal Coordinator"

The Industry Recovery section has keyed its activities up to a high pitch. Its headquarters in the Department of Commerce buzz with workers, from General Johnson down. Visit-

ing delegations from all industrial and business lines throughout the country are present anxiously seeking information fitting themselves into the gigantic machine. Volumes of correspondence are being answered and await answer. Centered about the inquiries is the question of codes of fair practices, some of which already have been passed upon, some awaiting hearings. One of the busiest offices is that of W. L. Allen, an assistant under General Johnson in charge of iron and steel and metals. While the title has not been officially given, Mr. Allen is known as the steel coordinator. Mr. Allen formerly was chairman of the Sheffield Steel Corp., Kansas City, Mo., now a part of the American Rolling Mill Co. It is understood that Mr. Allen has passed on some codes. The code being prepared by the American Iron and Steel Institute apparently will come before him and, of course, will be the "master code" for the iron and steel industry.

Basic Steel Code to Come First

The complexity of the steel industry, with some 30 related organizations serving diversified branches such as fabrication, casting, forging, etc., has given rise to confusion of thought with regard to the order in which these various branches will be codified.

Deputy administrator W. L. Allen in charge of the metals section of the industrial recovery administration said Tuesday that while no precedence as such has been set up for filing of codes of fair practices it is the plan to have those covering an entire industry supplemented by codes of correlated units. It was stated that codes of any group of the iron and steel industries will be given attention as they are presented but it is the purpose that they shall supplement a general code.

In this connection it was made known that national committees are being set up in the railroad supply and other fields to prepare master codes. They will be supplemented by codes of correlated units in the affected industries.

In an eagerness to comply with the administration's intentions, there has been an overanxiety, in some cases, to rush codes into shape for submission. This is both unnecessary and likely to be confusing. It is stated authoritatively, that the basic steel code now in preparation by the American Iron and Steel Institute will take priority. Acceptance of related codes for various specialized branches of the industry must await the acceptance of the basic steel code and will have to be written, so far as possible, in conformity with it.

Codes presented provide for increased wages, shorter hours of work and often for systems of cost accounting on which to base prices which will be raised generally. But increases in

prices, under the administration plan, are to be deferred. Wage increases are to come first, with some possible exceptions, so that purchasing power can be raised. The idea is to eliminate the disparity between the curve of production and the curve of purchasing power, lifting the latter to a level with the former.

July Expected to Initiate Movement

"While acceptable proposals of no trade group will be delayed it is my hope that the 10 major industries which control the bulk of the industrial employment can submit their simple basic codes at once and that the country can look forward to the month of July as the beginning of our great national movement back to work," President Roosevelt said in his statement.

The code of the American Iron and Steel Institute will be in form for discussion by the membership next week. After it is approved by the Institute it will be submitted to the administrator who will arrange for the required hearings. It will probably be at least 30 days before this basic steel code can be put into effect.



E. N. HURLEY
Industrial Advisory Board

The President emphasized the necessity of raising wages first to be followed by higher prices.

He pointed out that the idea is simply for employers to hire more men to do the existing work by reducing the work hours of each man's week and at the same time paying a living wage for the shorter week. He declared that no employer and no group of less than all employers in a single trade could do this alone and continue to live in business competition.

"But if all employers in each trade now band themselves faithfully in these modern guilds—without exception—and agree to act together and at once, none will be hurt, and millions of workers, so long deprived of the right to earn their bread in the sweat of their labor, can raise their heads again," the President declared. "The challenge of this law is whether we can sink selfish interest and present a solid front against a common peril."

Opportunists Warned by President

The President warned against slackers in trade groups. He insisted that all industries and groups must cooperate. Labor also was told that the law is a challenge to it, calling for its cooperation as well.

"Workers, too, are here given a new charter of rights long sought and hitherto denied," the President said. "But they know that the first move expected by the nation is a great co-operation of all employers, by one single mass action, to improve the case of workers on a scale never attempted in any nation. Industries

tration. He explained that it relaxes some of the safeguards of the anti-trust laws. The public, he stated, must be protected against the abuses that led to their enactment "and to this end we are putting in place of old principles of unchecked competition some new government control." These, it was stated, must be impartial and just. Their purpose was described as being to free business—not to shackle it—and, it was added, no man who stands on the constructive, forward-looking side of his industry has anything to fear from them. To such men, the President said, the opportunities for individual initiative will open more amply than ever.

"Let me make it clear, however," President Roosevelt warned, "that the anti-trust laws still stand firmly against monopolies that restrain trade and price fixing which allows inordinate profits or unfairly high prices."

Racketeers Will Get Short Shrift

He said that the government must protect trade groups which expose their business as never before from undermining by members who are unwilling to do their part. Also it was stated protection must be given from "the racketeers who invade organizations of both employers and workers."

This point of the President's attack is held to have been directed against price cutters and labor agitators.

As to the machinery of the law, the President said that "the practical way of accomplishing what we are setting out to do, when a trade association has a code ready to submit and the association has qualified as truly representative and after reasonable notice has been issued to all concerned, a public hearing will be held by the administrator or a deputy. A labor board appointed by the Secretary of Labor will be responsible that every affected labor group, whether organized or unorganized, is fully and adequately represented in an advisory capacity and any interested labor group will be entitled to be heard through representatives of their own choosing. An industrial advisory board appointed by the Secretary of Commerce will be responsible that every affected industrial group is fully and adequately represented in an advisory capacity and any interested industrial group will be entitled to be heard through representatives of its own choosing. A consumers' advisory board will be responsible that the interests of the consuming public will be represented and every reasonable opportunity will be given to any group or class who may be affected directly or indirectly to present their views."

After the hearings have been studied by a competent economic staff the Administrator will present the subject to the President.



GERARD SWOPE
Industrial Advisory Board

The President said he is fully aware that wage increases will eventually raise costs but he asked that managements give first consideration to the improvement of operating figures by greatly increased sales to be expected from the rising purchasing power of the public. He said that "If we now inflate prices as fast and as far as we increase wages the whole subject will be set at naught. We cannot hope for the full effect of this plan unless in these first critical months, and even at the expense of full initial profits, we defer price increases as long as possible. If we can thus start a strong, sound upward spirit of business activity our industries will have little doubt of black ink operations in the last quarter of this year. The pent-up demand of this people is very great and if we can release it on so broad a front, we need not fear a lagging recovery. There is greater danger of too much feverish speed."

The President also dealt with the matter of forward buying at unduly depressed prices, and said it will be a part of the wide industrial co-operation for those having the benefit of these forward bargains to take the initiative in revising them to absorb some share of the increase in their suppliers costs. The President had explained that increased costs resulting from the government movement may make it very hard for some manufacturers and jobbers to fulfill some of their present contracts without loss.

Attitude of Organized Labor Awaited

Many industrialists are awaiting with much interest and considerable concern the attitude of organized

(Continued on Page 1013)



A. P. SLOAN
Industrial Advisory Board

can do this only if they have the support of the whole public and especially of their own workers. This is not a law to foment discord and it will not be executed as such. This is a time for mutual confidence and help and we can safely rely on the sense of fair play among all Americans to assure every industry which now moves forward promptly in this united drive against depression that its workers will be with it to a man."

The law was also pictured by the President as a challenge to adminis-

... PERSONALS ...

R. B. WILSON, sales manager of the St. Louis plant of Joseph T. Ryerson & Son, Inc., has been made manager of the St. Louis plant of that company. Mr. Wilson, who has had long experience in the steel business, first became associated with the Ryerson company in Chicago. He was a member of the shipping and sales departments for some years and was then transferred to St. Louis in charge of the city sales department. Later he was made sales manager and assistant to H. B. Ressler, who was then manager of the St. Louis plant and now is vice-president in charge of sales of the Ryerson company.

♦ ♦ ♦

EDWARD C. BAYERLEIN, senior vice-president and treasurer, Nordberg Mfg. Co., Milwaukee, has returned from Europe after an absence of six months. His primary object was to visit the company's branch in London, but he also made excursions into Germany, Holland and Scotland.

♦ ♦ ♦

H. A. SCHWARTZ, manager of research of the National Malleable & Steel Castings Co., Cleveland, has received the honorary degree of doctor of science from Rose Polytechnic Institute.

♦ ♦ ♦

E. D. FROHMAN, vice-president and the Pittsburgh district manager for the S. Obermayer Co., maker of foundry supplies and equipment, has been elected president of the Alumni Association of the Rose Polytechnic Institute, Terre Haute, Ind.

♦ ♦ ♦

Dr. E. A. RYKENBOER, heretofore assistant general manager of the R. & H. chemicals department of the E. I. du Pont de Nemours & Co., has become general manager of that department. MILTON KUTZ has been appointed assistant general manager of the department.

♦ ♦ ♦

BRUCE HAINES, who has been general manager of the Hammond Sheet Metal Co., St. Louis, has purchased a controlling interest in the E. E. Souther Iron Co., manufacturer of sheet metal products, in that city.

No change will be made in the firm name or personnel.

♦ ♦ ♦

WILLIAM E. FRIEDMAN, of A. H. Sanders & Co., was reelected president of the New York chapter of the Institute of Scrap Iron and Steel, and DAVID STRAUSS, of Continental Iron & Steel Co., and MORRIS MACHLIN, of Machlin Brothers, Inc., were elected first and second vice-presidents, re-



R. B. WILSON

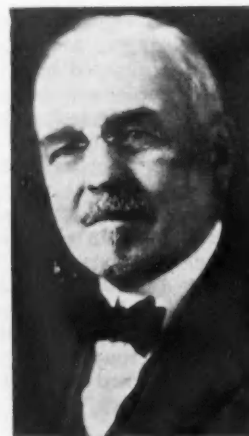
spectively. Other officers elected include GEORGE BETTEN, of S. Betten & Sons, secretary; JOSEPH A. MOSKOWITZ, of M. Samuel & Sons, Inc., treasurer; P. W. BOWERS, of P. W. Bowers & Co., chairman of the executive board. The executive board will consist of the officers and the following: J. L. SPITZER, of Schiavone-Bonomo Corp., and THOMAS F. KELLY.

♦ ♦ ♦

WILLIAM A. GAYOU has been appointed to succeed P. E. Anderson as resident agent of Bethlehem Steel Co. at Kansas City, Mo. Mr. Gayou's address is Kansas City Athletic Club. Mr. Anderson is transferred to the Bethlehem staff at Houston, Tex.

OBITUARY

JAMES A. SHEPARD, vice-president and consulting engineer of the Shepard Niles Crane & Hoist Corp., died at his summer home at Kayutah Lake,



J. A. SHEPARD

N. Y., on June 10, aged 69 years. In 1880, in partnership with his father and brother, he established a foundry and machine shop in Montour Falls under the name of W. H. Shepard & Sons. Several years later the name was changed to the Havana Bridge Works. After the sale of the bridge company in 1903, Mr. Shepard founded the General Pneumatic Tool Co., which later became the Shepard Electric Crane & Hoist Co. When this company reorganized as the Shepard Niles Crane & Hoist Corp. several years ago, Mr. Shepard was made vice-president and consulting engineer. He was a member of the American Society of Mechanical Engineers and at one time had been chairman of its Materials Handling Division. During the World War Mr. Shepard was a county food administrator and in 1929 was assemblyman for his district in the New York State Legislature.

♦ ♦ ♦

FELIX C. SANDSTROM, mechanical engineer and inventor, died at his home in Milwaukee on June 10, aged 58 years. He was born in Sweden, where he received his technical education, and came to America in 1900 for a year of study. He returned in 1905 to become chief engineer, American Gas Accumulator Co., Philadelphia. Later he represented Swedish industries in Kobe, Japan, but returned to America a third time in 1923 to join the Milwaukee works of the International Harvester Co. as chief engineer, experimental department, cream separator division, a position he held until his death.

♦ ♦ ♦

EDWARD W. GROTENRATH, secretary-treasurer, American Machinery Co., Milwaukee, died June 13, aged 48 years. He had been ill several months. His brother, Fred, Jr., is president, and another brother, George, is vice-president of the company.

♦ ♦ ♦

CHARLES A. CLOUGH, for more than 30 years associated with the General Electric Co., part of the time as inspector of warehouses and supplies throughout the country, died at his home in Vineyard Haven, Mass., on June 16, aged 74 years.

♦ ♦ ♦

WILLIAM F. SELLERS, recently retired as president of the Edge Moor Iron Co., Edge Moor, Del., died at his local residence, "Clifton," June 14, aged 77 years. He was born in Philadelphia and was graduated from the University of Pennsylvania in 1876. Immediately following, he entered the employ of the Edge Moor company, organized by his father, the late William Sellers, first president of the company. Some time after the death of his father, Mr. Sellers became head of the organization, continuing in that

capacity until last February, when he resigned the office, continuing as a director of the company. He was also a director of William Sellers & Co., Philadelphia, a member of the American Society of Mechanical Engineers and other organizations.

♦ ♦ ♦
HENRY SMITH, for over 25 years resident manager of THE IRON AGE in Cincinnati, died at a hospital in that city on June 3, aged 76 years. He became identified with THE IRON AGE in February, 1872, and eight years later was sent to Chicago to open an office in that city. He was transferred to the management of the Cincinnati office in 1883. Mr. Smith organized the Record Publishing Co. in 1911 and became editor and publisher of the *American Machine and Tool Record*. He retired in 1921.

♦ ♦ ♦
WILLIAM CHRISTY FARRAR, president of the Farrar Pump & Machinery Co., which he operated for 53 years, died at St. Louis. He was 77 years old. He was graduated from Washington University Law School.

♦ ♦ ♦
HECTOR H. HINES, for many years manager of Canadian sales for the Bethlehem Steel Co., with headquarters at Montreal, until he retired several years ago on account of ill health, died recently at Hamilton, Ont. He previously had represented Bethlehem at San Francisco and at Syracuse, N. Y. For 10 years preceding that he was with the Consolidated Steel Co.

Mills Fall Behind on Deliveries of Some Products in Valleys

YOUNGSTOWN, June 20.—Valley mills continue to register gains in releases, as consumers hasten to specify against old low-priced contracts. The acceleration is expected to be even more pronounced this week and next. Mills are already falling behind on deliveries of some products and sufficient backlogs will have been accumulated by June 30 to assure heavy operations in the first half of July. Present specifications are not all for immediate consumption, as buyers are taking advantage of the opportunity to build up their inventories. In most cases, efforts on the part of consumers to increase their old contracts for immediate shipment are being refused by mills.

Tin plate demand has reached virtual capacity in the Valleys and most mills are fully scheduled for about four weeks. Sheet mills are engaged at 50 per cent and the recent rush of specifications indicates a higher rate before the end of the month. The strip industry is running at about 45 per cent, with hot-rolling mills engaged at a slightly higher rate than cold-rolling. Demand for bars is expanding and is well diversified, supporting an operation of at least 40 per cent. Wire products are more active than they have been, but extension of present contracts into

July, with the last date of shipment moved up to Aug. 15, has relieved the stress of releases somewhat. Pipe production is comparatively high in the Valleys this week, but some makers are producing stock sizes and the rate of demand has failed to keep pace with other finished steel products.

Steel ingot production this week will average at least 55 per cent in Valley and nearby northern Ohio mills. The leading interest is running at a higher rate and a part of recent gains has come from added activity in Bessemer departments. Another steel works blast furnace has been added and 14 stacks are now active in the district. Steel companies are taking advantage of improved demand to build up their depleted inventories of raw steel, although pig iron stocks in the district were already comparatively high and are not being augmented. Nevertheless, little strictly merchant iron was available and the greater part of current production is going directly into consumption in the form of ingot molds.

Steel producers in this district, as in others, have generally refused to make third quarter contracts, but in some cases have been forced to cover customers for the month of July. This has led to the belief on the part of some persons that commitments on many products will be limited to monthly periods until the full results of the National Industrial Recovery Act can be ascertained. Such a plan is already in effect on wire products and a few sheet buyers have been covered in that manner. On hot and cold-rolled strip, contracts have been taken for the entire quarter at 1.60c. and 2c., Pittsburgh, respectively.

In anticipation of definite announcement of forward sheet prices this week, several makers are again attempting to simplify quotations by the establishment of only two classifications, covering hot-rolled and cold-rolled sheets. The plan to quote cold-rolled sheet on a mill run basis has been abandoned and a flat price will be set up covering material satisfactory for customer requirements. On automobile body and steel furniture stock, the usual extras for drawing quality, resquaring, etc. will be added.

Last Minute Sales Leads

(Received too late for classification in our Plant Expansion Section)

Canfield Oil Co., Coraopolis, Pa., has plans for expansion and improvements, including new unit for capacity of about 500 bbl. daily, making total plant output of 1500 bbl. a day. Cost about \$100,000 with equipment. New battery of steel tanks will be built for storage and distribution. R. W. Helm is superintendent.

Lyndhurst Township Board of Education, High School Building, Lyndhurst, N. J., Arthur B. Guthrie, district clerk, asks bids until June 27 for manual training school supplies.

United States Engineer Office, First District, 333 North Michigan Avenue, Chicago, will ask bids soon for standby power units for locks on Illinois Waterway at Brandon Road, Marseilles, Starved Rock and Dresden Island.

Arthur E. Harvey, 3875 Wilshire Boulevard, Los Angeles, architect, has plans for new brewery in San Fernando Valley district for company whose name is temporarily withheld. Project will include one-story electric-operated ice-manufacturing and refrigerating plant. Cost about \$200,000 with equipment.

City Controller, City-County Building, Pittsburgh, asks bids until June 26 for street and sewer castings, canning equipment, etc.

Texas Brewing Co., San Antonio, Tex., recently organized by S. L. Gill, 110 East Huachuca Street, and associates, has taken over plant of San Antonio Tanning Co., Fratt, Tex., about 8 miles from city, and will remodel for brewery. Addition will be built for mechanical bottling. Cost about \$250,000 with machinery.

Construction Service, Veterans' Administration, Washington, asks bids until June 27 for

new gas distribution system at institution at Alexandria, La., including pipe lines, etc.

Consolidated Water Power & Paper Co., Wisconsin Rapids, Wis., and Wisconsin Valley Improvement Co., Wausau, Wis., Harold L. Geisse, secretary, jointly, plan hydroelectric generating plant on Wisconsin River, near Knowlton, Wis., in connection with water storage project. Cost about \$1,640,000 with power dam, transmission lines, switching stations and other structures.

Macassa Gold Mines, Ltd., care of R. A. Bryce, 330 Bay Street, Toronto, president, has plans for new milling plant of several units at properties at Kirkland Lake, Ont., for handling about 500 tons ore daily. Cost over \$200,000 with machinery.

Bureau of Ordnance, Navy Department, Washington, E. B. Larimer, chief, asks bids until June 29 for 20,300 5-in. 38 caliber anti-aircraft common illuminating projectiles, and 5400 5-in. 25 caliber similar projectiles.

United States Engineer Office, First District, New York, asks bids until June 27 for three complete sets 26-in. gate valves, with operating cylinder and indicator rod, patterns, jigs, templates and molds; three four-way control valves and three three-way plug valves (Circular 282).

Hughes Tool Co., 300 Hughes Street, Houston, Tex., manufacturer of oil well tools and equipment, has filed plans for extensions and improvements in one of plant buildings. Cost about \$45,000 with equipment.

Charles A. Brady, 435 Forty-second Avenue, San Francisco, has plans for a combination brewery, winery and warehouse. Cost about \$1,250,000.

To Ask Bids on Large Public Road Program

WASHINGTON, June 20.—It has been announced at the Public Works Administration that bids soon will be asked for public roads projects for which \$400,000,000 will be spent. The money will be allocated to the States, which will administer the works.

Employee Representation Established By Carnegie and Other Steel Plants

IN accordance with the requirements of the National Industrial Recovery Act, the Carnegie Steel Co., Pittsburgh, has announced a plan of employee representation which is designed to give "employees of the company a voice in regard to the conditions under which they labor and to provide more effective communication and means of contact between the management and employees on matters pertaining to industrial relations." Similar plans will be placed in operation by the other subsidiaries of the United States Steel Corp., while the Jones & Laughlin Steel Corp., Pittsburgh, and the Republic Steel Corp., Youngstown, have taken similar action. The Youngstown Sheet & Tube Co., Youngstown, and the Bethlehem Steel Corp., Bethlehem, Pa., are among the other large independent companies which have operated under such plans for many years.

Under the Carnegie plan, representation shall range from one representative for each 100 employees in the small plants to one for each 300 in the larger units. Any employee who has been on the company's payroll for a period of one year, prior to nominations, who is an American citizen at least 21 years of age, will qualify for representation. Company officials and persons having the right to hire or discharge shall not be eligible as representatives or allowed to vote. Nominations and elections shall be held annually and representatives shall be elected for one-year terms, but will be eligible for re-election.

The management's representative shall be appointed by the company and shall keep the management in touch with the representatives, representing it in negotiations with the employees, their officers and committees. Committees shall be formed by the employee representatives for consideration of the following subjects: rules, ways and means, safety and prevention of accidents, economy and waste prevention, wages and tonnage rates, hours of employment and working conditions, housing and living conditions, health and works sanitation, education and publications, athletics and recreation and continuity of employment and condition of industry.

Of particular interest is the section of the plan guaranteeing the independence of employees, which is quoted in full as follows:

"It is understood and agreed that each representative shall be free to discharge his duties in an independent manner, without fear that his individual relations with the company may be affected in the least degree by any action taken by him in good faith in his representative capacity.

"To insure to each representative his right to such independent action, he shall have the right to take the question of an alleged personal discrimination against him, on account of his acts in his representative capacity, to any of the superior officers; to the general joint committee, and to the president of the company.

British Steel Feels Export Pull

LONDON, ENGLAND, June 20 (By Cable).—British iron and steel is undergoing a gradual but nevertheless definite improvement. This comes through the increase in shipments for export to other countries, the rise in these demands being sufficient to more than offset the lessened home buying.

Exports for May included 12,000 tons of pig iron, of which 4050 tons

"Having exercised this right in the consecutive order indicated and failing a satisfactory remedy within thirty days, a representative shall have the further right to appeal to the State Department of Labor or the Secretary of Labor of the United States. The company shall furnish the said State Department of Labor or the said Secretary with every facility for the determination of the facts, and the findings and recommendations of the said State Department of Labor or the said Secretary shall be final and binding."

went to the United States. Total British exports of iron and steel of all kinds amounted to 179,000 tons for the month.

Tin plate sales remain moderate, but the works are in good position and are operating at about a 55 per cent rate.

The Continental steel market is still unsettled by the uncertainties involved in the operation of the European Raw Steel Cartel, C.I.F. prices not yet having been established. Belgium and Luxemburg expect a 10 per cent production cut in their quotas for the first quarter of the cartel year. Twenty-five Belgian dealers have expressed allegiance to the new Belgian cartel, but others are unfavorably disposed to it, partly because of the requirement of a deposit of one thousand gold pounds to cover possible fines and forfeits.

International Rail Makers' Association reports a quiet market with prices unchanged. International Wire Export Co. is meeting June 22 to discuss the recent serious fall in wire exports and hopes to reach an agreement with American manufacturers who are now competing keenly in Europe and particularly in Holland.

Several independent German tube makers have formed a syndicate styled "Freier Rohenhandel" to sell Polish, Swedish and Hungarian tubes at below cartel prices.

High Level in German Steel Exports and Imports

German foreign trade in iron and steel reached its high level of the year during April when exports totaled 144,001 tons and imports 72,890 tons, according to a report to the Commerce Department's Iron and Steel Division. Exports increased by 13,836 metric tons over the March total while April imports were 7,672 tons greater than in the preceding month.

British Prices f.o.b. United Kingdom Ports

Per Gross Ton			
Ferromanganese, export	\$9		
Billets, open-hearth	\$5	to \$5 7s. 6d.	
Black sheets, Japanese specifications	\$11		
Tin plate, per base box	17s. 3d.	to 17s. 6d.	
Steel bars, open-hearth	\$7 17½s.	to \$8 7½s.	
Beams, open-hearth	\$7 7½s.	to \$7 17½s.	
Channels, open-hearth	\$7 12½s.	to \$8 2½s.	
Angles, open-hearth	\$7 7½s.	to \$7 17½s.	
Black sheets, No. 24 gage	\$8 10s.		
Galvanized sheets, No. 24 gage	\$10 10s.	to \$10 15s.	

Continental Prices f.o.b. Continental Ports

Per Metric Ton, Gold £ at \$4.86	
*Ingots	\$2 5s.
*Billets, Thomas	\$2 7s.
Wire rods, No. 5 B.W.G.	\$4 10s.
Black sheets, No. 31 gage, Japanese	\$11 5s.
*Steel bars, merchant	\$3
*Sheet bars	\$2 8s.
Plates, ¼ in. and up	\$3 18s. 6d.
*Plates, ⅝ in. and 5 mm.	\$4 1s.
*Sheets, ¼ in.	\$4 6s.
*Ship plates	\$4 10s.
*Beams, Thomas	\$2 16s. 6d.
*Angles (basis)	\$3
Hoops and strip steel over 6-in. base	\$3 12s. 6d.
Wire, plain, No. 8	\$5 7s. 6d.
Wire nails	\$5 15s.
Wire, barbed, 4-pt. No. 10 B.W.G.	\$3 15s.

*Prices as established by European Raw Steel Cartel.

SUMMARY OF THIS WEEK'S BUSINESS

Bulge in Second Quarter Releases Drives Output to New High

Steel Ingot Production Reaches 50 Per Cent of Capacity—Quarterly
Quotations Unlikely to Be Resumed Until Code Goes Into Effect

RISING three points from 47 per cent of capacity, steel production has reached a 50 per cent rate for the first time since April, 1931. Operations have advanced from 35 per cent to 40 per cent at Pittsburgh, from 46 to 50 per cent at Chicago, from 36 to 48 per cent at Buffalo, from 50 to 55 per cent in the Valleys, from 23 to 26 per cent in eastern Pennsylvania and from 63 to 67 per cent in the Cleveland-Lorain district. The Wheeling district remains on an 85 per cent basis, while the Great Lakes plant at Detroit continues to run at capacity.

Still further gains are indicated by additional blast furnace resumptions. A steel works blast furnace has been lighted in the Valleys, and one has been blown in at Chicago, with another scheduled to go in next week. At Pittsburgh two steel plant stacks will be added to the active list this week, while a third is scheduled to go in early next month.

WITH steel buyers increasing their specifications and pressing for shipments, mills are beginning to experience difficulty in keeping up with demand, in some cases falling behind on deliveries. These evidences of growing market tension, emphasized by the appearance of a scarcity of skilled labor in certain Eastern mills, are reminiscent of conditions which have been conspicuous by their absence since the '20's.

The primary cause of the bulge in demand is the piling up of releases against low-priced second quarter contracts as the June 30 deadline draws near. While all of this tonnage will not get into immediate consumption, speculative buying has been held down both by the tonnage limitations of contracts and the unsatisfactory financial standing of many buyers. In the automobile industry, at least, there has been little protective buying. The bulk of the steel placed thus far by the motor car builders has been for immediate requirements and their main concern has been to get deliveries on time. To guard against interruptions in their production schedules they are having much of their steel rushed to their plants by motor truck.

The persistence of a heavy retail demand for automobiles is a continuing cause of surprise to the motor car trade itself. June automobile output, according to present indications, will exceed that of May, and the movement of steel to the motor car industry promises to continue at the present pace through most of July.

STEEL mills still refrain from quoting for third quarter except with a stipulation protecting them against increased production costs incident to the

National Industrial Recovery Act. Pending the completion of a code by the steel industry and its acceptance at Washington, it is unlikely that quarterly contracting will be resumed. Meanwhile prices will probably be named from month to month. Mills that put in bids Monday on the New York Central's third quarter requirements quoted for July shipment only.

The price outlook is not only clouded by the uncertainty of labor costs but by disturbing evidences of aggressiveness on the part of union organizations. Persistent efforts are being made to unionize coal mines in the Connellsville region despite the express warning of President Roosevelt that the new legislation is not intended to "foment discord." However, a reassuring note is found in one of General Johnson's first official pronouncements. Emphasizing the need of speed in getting industrial codes into operation, he makes it plain that their provisions need not be "arrived at by collective bargaining."

The iron and steel industry will probably get a stronger stimulus from the public works section of the new act than from the part under the administration of the General. Bids will be asked promptly on public road projects on which \$400,000,000 will be spent and there will be early action on the Navy's program, which calls for the construction of 32 ships, requiring 66,400 tons of plates, shapes and bars. Bids from private builders will be taken on 17 of these vessels on July 26, while the remaining 15 will be gotten under way as soon as possible in Government yards. In addition, contracts will quickly be placed for public building projects on which bids were taken but on which final action was deferred in March.

PUBLIC work features structural steel awards of the week, which, at 22,800 tons, are the largest with one exception since February. Lettings of plate work are also outstanding, totaling 19,700 tons.

American mills are figuring on a South American inquiry for 25,000 tons of rails. Europe reports an invasion of American wire products, particularly in Holland.

Scrap manifests a strong undertone throughout the country, with scattered advances reported in some centers. Heavy melting grade has risen another 25c. a ton at Chicago, and THE IRON AGE composite for melting scrap has advanced from \$9.92 to \$9.96 a ton. The pig iron and finished steel composites are unchanged at \$15.01 a ton and 1.892c. a lb.

▲▲▲ A Comparison of Prices ▲▲▲

Market Prices at Date, and One Week, One Month and One Year Previous
Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron

Per Gross Ton:

	June 20, 1933	June 13, 1933	May 23, 1933	June 21, 1932
No. 2 fdy., Philadelphia.....	\$16.34	\$16.34	\$16.34	\$14.84
No. 2, Valley furnace.....	15.50	15.50	14.50	14.50
No. 2 Southern, Cin'ti.....	16.51	16.51	15.82	13.82
No. 2, Birmingham.....	12.00	12.00	12.00	11.00
No. 2 foundry, Chicago*.....	16.00	16.00	16.00	16.00
Basic, del'd eastern Pa.....	16.09	16.09	16.09	16.00
Basic, Valley furnace.....	15.00	15.00	14.00	14.00
Valley Bessemer, del'd P'gh..	17.89	17.89	16.89	16.89
Malleable, Chicago*.....	16.00	16.00	16.00	16.00
Malleable, Valley.....	15.50	15.50	14.50	15.00
L. S. charcoal, Chicago.....	23.17	23.17	23.17	23.17
Ferromanganese, seab'd carlots	68.00	68.00	68.00	68.00

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

Finished Steel

Per Lb. to Large Buyers:

	June 20, 1933	June 13, 1933	May 23, 1933	June 21, 1932
Hot-rolled annealed sheets, No. 24, Pittsburgh.....	2.10	2.10	2.10	2.20
Hot-rolled annealed sheets, No. 24, Chicago dist. mill...	2.20	2.20	2.20	2.30
Sheets, galv., No. 24, P'gh....	2.70	2.70	2.70	2.85
Sheets, galv., No. 24, Chicago dist. mill.....	2.80	2.80	2.80	2.95
Hot-rolled sheets, No. 10, P'gh	1.50	1.50	1.50	1.55
Hot-rolled sheets, No. 10, Chicago dist. mill.....	1.60	1.60	1.60	1.65
Wire nails, Pittsburgh.....	1.85	1.85	1.85	1.95
Wire nails, Chicago dist. mill.	1.90	1.90	1.90	2.00
Plain wire, Pittsburgh.....	2.10	2.10	2.10	2.20
Plain wire, Chicago dist. mill.	2.15	2.15	2.15	2.25
Barbed wire, galv., Pittsburgh	2.35	2.35	2.35	2.60
Barbed wire, galv., Chicago dist. mill.....	2.40	2.40	2.40	2.65
Tin plate, 100 lb. box, P'gh..	\$4.25	\$4.25	\$4.25	\$4.75

Rails, Billets, etc.

Per Gross Ton:

	June 20, 1933	June 13, 1933	May 23, 1933	June 21, 1932
Rails, heavy, at mill.....	\$40.00	\$40.00	\$40.00	\$43.00
Light rails at mill.....	30.00	30.00	30.00	32.00
Rerolling billets, Pittsburgh..	26.00	26.00	26.00	26.00
Sheet bars, Pittsburgh.....	26.00	26.00	26.00	26.00
Slabs, Pittsburgh.....	26.00	26.00	26.00	26.00
Forging billets, Pittsburgh...	31.00	31.00	31.00	33.00
Wire rods, Pittsburgh.....	35.00	35.00	35.00	37.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb..	1.60	1.60	1.60	1.60

Old Material

Per Gross Ton:

	June 20, 1933	June 13, 1933	May 23, 1933	June 21, 1932
Heavy melting steel, P'gh....	\$11.75	\$11.75	\$11.50	\$8.75
Heavy melting steel, Phila...	9.25	9.25	9.00	6.25
Heavy melting steel, Ch'go...	8.87 1/2	8.75	8.50	5.50
Carwheels, Chicago.....	9.50	9.50	9.50	5.50
Carwheels, Philadelphia.....	10.25	10.25	9.75	8.00
No. 1 cast, Pittsburgh.....	10.50	10.50	10.50	9.00
No. 1 cast, Philadelphia.....	10.25	10.25	10.25	8.00
No. 1 cast, Ch'go (net ton)...	8.75	8.75	8.75	6.00
No. 1 RR. wrot., Phila.....	10.75	10.75	10.75	8.50
No. 1 RR. wrot., Ch'go (net)...	6.50	6.50	6.50	3.75

Finished Steel

Per Lb. to Large Buyers:

	Cents	Cents	Cents	Cents
Bars, Pittsburgh.....	1.60	1.60	1.60	1.60
Bars, Chicago.....	1.70	1.70	1.70	1.70
Bars, Cleveland.....	1.65	1.65	1.65	1.65
Bars, New York.....	1.95	1.95	1.95	1.95
Tank plates, Pittsburgh.....	1.50	1.50	1.50	1.60
Tank plates, Chicago.....	1.70	1.70	1.70	1.70
Tank plates, New York.....	1.598	1.598	1.598	1.898
Structural shapes, Pittsburgh.	1.60	1.60	1.60	1.60
Structural shapes, Chicago...	1.70	1.70	1.70	1.70
Structural shapes, New York.	1.86775	1.86775	1.86775	1.86775
Cold-finished bars, Pittsburgh.	1.70	1.70	1.70	1.70
Hot-rolled strips, Pittsburgh..	1.55	1.55	1.55	1.40
Cold-rolled strips, Pittsburgh.	2.00	2.00	2.00	2.00

Coke, Connellsville

Per Net Ton at Oven:

	June 20, 1933	June 13, 1933	May 23, 1933	June 21, 1932
Furnace coke, prompt.....	\$1.75	\$1.75	\$1.75	\$2.00
Foundry coke, prompt.....	2.50	2.50	2.50	3.00

Metals

Per Lb. to Large Buyers:

	Cents	Cents	Cents	Cents
Electrolytic copper, refinery..	7.75	7.75	6.75	5.12 1/2
Lake copper, New York.....	8.00	8.00	7.00	5.50
Tin (Straits), New York.....	44.95	46.00	36.00	19.50
Zinc, East St. Louis.....	4.35	4.30	3.77 1/2	2.80
Zinc, New York.....	4.72	4.67	4.14 1/2	3.17
Lead, St. Louis.....	4.05	4.05	3.52 1/2	2.90
Lead, New York.....	4.20	4.20	3.65	3.00
Antimony (Asiatic), N. Y....	6.50	6.50	6.25	5.12 1/2

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

▲▲▲ The Iron Age Composite Prices ▲▲▲

Finished Steel

June 20, 1933
One week ago
One month ago
One year ago

1.892c. a Lb.
1.892c.
1.892c.
1.970c.

Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot rolled strip. These products make 85 per cent of the United States output.

	High	Low
1933	1.948c., Jan. 3;	1.867c., Apr. 18
1932	1.977c., Oct. 4;	1.926c., Feb. 2
1931	2.037c., Jan. 13;	1.945c., Dec. 25
1930	2.273c., Jan. 7;	2.018c., Dec. 9
1929	2.317c., April 2;	2.273c., Oct. 29
1928	2.286c., Dec. 11;	2.217c., July 17
1927	2.402c., Jan. 4;	2.212c., Nov. 1

Pig Iron

\$15.01 a Gross Ton
15.01
14.56
14.01

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	High	Low
\$15.01, May 29;	\$13.56, Jan. 3	
14.81, Jan. 5;	13.56, Dec. 6	
15.90, Jan. 6;	14.79, Dec. 15	
18.21, Jan. 7;	15.90, Dec. 16	
18.71, May 14;	18.21, Dec. 17	
18.59, Nov. 27;	17.04, July 24	
19.71, Jan. 4;	17.54, Nov. 1	

Steel Scrap

\$9.96 a Gross Ton
9.92
9.67
6.83

Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	High	Low
\$9.96, June 20;	\$6.75, Jan. 3	
8.50, Jan. 12;	6.42, July 5	
11.33, Jan. 6;	8.50, Dec. 29	
15.00, Feb. 18;	11.25, Dec. 9	
17.58, Jan. 29;	14.08, Dec. 3	
16.50, Dec. 31;	13.08, July 2	
15.25, Jan. 11;	13.08, Nov. 22	

Pittsburgh Ingot Rate Now 40 Per Cent of Capacity

Steel Releases Pile Up as Buyers Complete Specifications Against Second Quarter Contracts—Prices Still Undetermined

PITTSBURGH, June 20.—Finished steel releases in this district continue to increase as consumers complete specifications against second quarter contracts. Practically all products are affected, but bars, sheets, strip steel, plates and wire products continue to be more active than the heavy tonnage items. Structural steel is possibly moving in lighter volume, and demand for pipe is by no means keeping pace with recent increases in production. The local rail mill is inactive, and rolling of the recent Norfolk & Western order may be deferred, as delivery is not specified before fall. Plans of the Federal Government for public works, highways and warships promise heavy tonnages in the fall, but will not be felt immediately except on projects on which general contract bids had already been taken and which had been deferred by the uncertainty of legislation.

Finished steel prices for the third quarter have not yet been announced, and will probably be held up until the industry formulates a code for operation under the National Industrial Recovery Act. In the meantime, a little tonnage in sheets and strip has been placed, although contracts generally contain a clause to protect sellers against increased production costs. Makers of wire products may come out this week with quotations for the month of July.

Steel ingot production in the Pittsburgh district continues to rise, and will probably average nearly 40 per cent for the week as a whole. Two steel corporation blast furnaces will be added to the active list by Saturday. Most of the independent steel makers in the district have increased open-hearth melt, and an independent blast furnace is being repaired for resumption of production early in July. In the Valleys and nearby northern Ohio plants, steel production has risen to nearly 55 per cent of capacity, while the Wheeling district is easily holding its own.

Tin plate production is approaching capacity, with some producers scheduling extra turns to bring output over the theoretical 100 per cent rate. Finishing mill schedules are higher on practically all products except rails and structural steel.

Pig Iron

Shipments are increasing steadily with all producers in this territory, but new buying is confined largely to small lots which are bringing the full

quoted prices. A considerable tonnage of Bessemer malleable iron is going into ingot molds, although the furnaces which supply these plants are by no means fully occupied on this business. The market on low phosphorus iron has strengthened considerably in the last month, and is now quoted at \$24 a ton, Valley furnace, with even higher prices effective where freight rates are favorable. Prices on the other grades are unchanged.

Wire Products

Releases this month have been much heavier than they were in May, and seem to be growing as the middle of the year approaches. While the practice of quoting quarterly prices has been discontinued, some mills are taking tonnage for the month of July which must be shipped prior to Aug. 15. Spring manufacturers are slightly busier, and there is a steady movement to makers of automobile wire wheels. Demand from the merchant trade is confined largely to small tonnages because of the inability of jobbers to finance heavy purchases. Prices are well maintained at \$1.85 a keg on nails, and 2.10c. a lb., Pittsburgh, on manufacturers' wire.

Semi-Finished Steel

With third quarter prices on billets, slabs and sheet bars still withheld, no new buying is reported, but shipments against old contracts continue heavy. Forging billets are in steady demand with the price firm at \$31, Pittsburgh. Wire rods are also more active, and consumers are pressing for coverage over the third quarter. In most cases makers are quoting only on a monthly basis, and the \$35, Pittsburgh or Cleveland, price is firm.

Rails and Track Accessories

The Norfolk & Western has placed 10,000 tons of rails, 7500 tons with the Carnegie Steel Co. and 2500 tons with the Bethlehem Steel Co. The award of 11,470 tons of rails by the Seaboard Air Line was divided between the Southern maker and the Bethlehem company. Distribution of tie plates by this road was made in about the same proportion to the two companies. No new rail inquiry has appeared, but it is believed that the carriers will make expenditures for maintenance of way prior to new equipment. Under the circumstances, further traffic increases during the

summer should bring out considerable rail tonnage in the fall.

Cold-Finished Steel Bars

Demand is well sustained but has not improved particularly in the last week. Consumers are rapidly working out old contracts, but have been given no assurance of a price advance unless hot-rolled bars are marked up.

Tubular Goods

Demand for pipe continues to be quiet, although production is still at a higher rate, as makers build up depleted inventories. Stock manufacture is confined principally to butt-weld pipe and the standard sizes of seamless, and most of the larger mills are making this material in anticipation of future demand. Line pipe is still very dull, but there is a fair movement of mechanical tubing and boiler tubes. The prospect of a change in pipe discounts is rather vague at this time, but some upward revision would probably follow a marked increase in steel-making costs.

Bars, Plates and Shapes

Demand for structural steel is still rather dull, but the volume of reinforcing bar business is increasing, while plates and merchant bars are growing steadily more active. Specifications for merchant bars are coming from widely diversified sources, with the automotive industry still leading. However, cold-finishing mills are active users, and there is a better demand from forge shops and makers of machinery and equipment. The agricultural implement industry is still not a large user. Concrete reinforcing bar movement is made up principally of small lots, and highway construction is not the chief outlet. Considerable small-scale private construction and rehabilitation is going on, and this is developing more outlets for reinforcing bars as well as structural steel. Much of the tonnage is being placed through warehouses. Plate demand from the railroads is still of little moment, but the requirements of barge builders are growing, having been increased by 1500 tons last week with the placing of six barges by a New Orleans interest. Plate demand from the breweries is also well sustained, and promises to hold up for some time as the beer producers improve their financial status.

With third quarter prices on bars, plates and shapes still withheld, the market is very firm, and many large consumers who have enjoyed a \$2 a ton concession in the present quarter have been informed that they will be forced to pay the full quoted price in the next three months. The plate market is stronger, but concessions to meet the competition of Eastern mills are still reported in the Pittsburgh district. Reinforcing bars are unusually well maintained, with distributors quoting 1.60c., Pittsburgh, for

mill lengths, and 1.75c. for cut lengths.

Tin Plate

Continued heavy specifications have brought tin plate production almost to a capacity rate in the industry as a whole. Some large independent makers have been forced to run 18 turns to take care of their commitments, and the leading interest is engaged at better than 95 per cent. Current shipments are going largely to can makers who are anticipating higher production costs in some cases. It is too early for crop reports on most of the heavy vegetable packs, but such information as is available is generally favorable.

Strip Steel

Specifications against old contracts are well sustained and heavier with some mills. Buying is well diversified, and pressure for third quarter contracts is being felt keenly by some mills. Producers are more and more reluctant to quote for the next three months, even though a number of commitments have already been made. Contracts now being taken nearly all contain a clause to protect the producer against increased manufacturing costs.

Sheets

The rate of incoming specifications for sheet mill products continues to improve in this district. Practically all lines are affected, and releases are coming from all classes of buyers. Demand from the automotive industry has not diminished, and shipments to makers of electric refrigerators, steel furniture, shelving, lockers and many other products are gradually improving. Sheet makers believe that all of the tonnage now under contract will be ordered out by June 30, and some mills will be pressed to complete shipments by July 15 as called for under present arrangements. Production this week will average well over 45 per cent, and may reach 50 per cent before the end of the month.

Third quarter prices are being withheld by all makers, and complete new schedules will likely be announced in the near future. In the meantime, it is indicated that the practice of selling mill run cold-rolled sheets will be eliminated, and that the base on auto body and steel furniture stock will again be dropped. Quotations on this material will be based upon production costs in line with the requirements of the National Recovery Act. On some special grades of sheets this may lead to rather sharp increases. Higher galvanized sheet prices are also expected in view of the increased cost of smelter.

Scrap

Despite a continued strong tone in the scrap market, quotations have failed to rise in the last week. Significant mill buying of No. 1 heavy melting steel has been entirely lacking,

and offering prices by leading consumers have not been changed. Dealers are still reluctant to sell at these prices, and are having difficulty covering old orders at a profit. Most of them insist that No. 1 steel cannot move to the Pittsburgh district from either the East or Michigan at less than \$12. Local production is not heavy, and small dealers are hesitant to sell to brokers. Hydraulic compressed sheets are possibly stronger than heavy melting steel, with supplies confined almost entirely to nearby producers. Blast furnace scrap is slightly weaker on the basis of a sale at \$8. The other grades are strong, although buying by foundries is not in large volume.

Coal and Coke

Increased shipments of coke, together with reduced production at some plants because of labor difficulties, have tightened the market considerably in the last week, and price advances on practically all grades are in prospect in the near future. Foundry coke has been sold at \$3 a ton for the ordinary grade, and an advance in the \$4 price on the premium grades is imminent. Furnace coke is also stronger, with sales reported at as high as \$2.25 a ton, Connellsville. Recent minimum prices on all grades of coke are rapidly disappearing. Efforts to unionize mines in the Connellsville region have led to further wage advances on the part of the producers, and some large companies have made two 10 per cent increases in the last month. The H. C. Frick Coke Co. has placed an employee representation plan into effect.

Large Construction Awards on Coast

SAN FRANCISCO, June 19.—Construction on the Pacific Coast is on the increase, as shown by the rise in steel tonnages awarded. Steel contracts have been placed for 3221 tons of structural steel, 1141 tons of reinforcing bars and 12,020 tons of plates. New structural inquiries total 821 tons.

Encouragement has been given to the cast iron pipe trade by the calling of bids by San Francisco on 1595 tons and by Los Angeles on 7800 tons. Cast iron pipe awards of the week total 1710 tons.

Dates for bids have been set on two post offices, which indicates that activity will be resumed shortly on Federal projects. The trade is anticipating real benefit from national legislation that has just been passed, and better feeling is reflected in firmer prices.

The outstanding awards for the week were 10,000 tons of plates and shapes taken by the Moore Dry Dock Co. for the East and West bay substructures on the San Francisco-Oakland bridge, 4300 tons of plates

and ring girder for Bouquet Canyon dam taken by Western Pipe & Steel Co., and 1350 tons of cast iron pipe for Seattle placed with the United States Pipe & Foundry Co. It is reported that work is to start on the Los Angeles Times building, which will require 1000 tons of reinforcing bars and several hundred tons of shapes.

Ensley Mill Gets Order for 8270 Tons of Rails

BIRMINGHAM, June 20.—Pig iron has held to a steady course in June and shipments are even better than May, which was the best month in over a year. All three merchant producers in this district expect to show moderate increases. Foundry conditions in the South are generally better except among pressure pipe makers. The pipe outlook is still largely dependent on the government building program. Spot and third quarter pig iron is being booked at \$12, but it is understood there will be an advance to \$13 around July 1. Producers will begin the third quarter with a sizable tonnage on their books. Four furnaces have operated this month, two now being on basic iron and two on foundry.

Steel

New steel tonnage in the last two weeks has shown further gains and, as with pig iron, June will show a substantial improvement over May. The demand is general and all lines of lighter products are active, as well as some of the heavier grades. This tonnage is all for June delivery. July prices have not yet been announced. No third quarter business in some lines is being booked at this time, pending decision as to new prices.

The Seaboard Air Line has placed an order with the Tennessee Coal, Iron & Railroad Co. for 8270 tons of rails for early fall delivery; also for 480,000 tie plates. Railroad inquiries have shown marked improvement and additional tonnage is expected at an early date. There is talk that the Ensley rail mill will operate the last week in June, but confirmation cannot be secured at this time.

Three towns in Alabama have placed conditional contracts for water systems, which include five tanks, ranging from 50,000 to 150,000 gal. These were awarded the Chicago Bridge & Iron Works, Birmingham.

Ingalls Iron Works is launching two additional barges this month at its marine plant in Mobile. The Bessemer plant of the Nashville Bridge Co. will start to work this week on an increased schedule resulting from the release of 2000 tons of bridge steel for a Louisiana project. This tonnage was booked some months ago, as previously reported. Last week 12 open-hearth units were operated.

Steel Output Reaches 50 Per Cent of Capacity at Chicago

Rush of Orders as End of Quarter Approaches Includes Some Speculative Tonnage—Wire Industry Preparing Code

CHICAGO, June 20.—Steel production continues to climb, having reached 50 per cent of capacity. The leading producer has added a blast furnace and an independent mill will light a stack next week. There are now 10 steel works blast furnaces in use out of 36 in the district.

Business reaching sellers is of a general character and is admittedly more speculative than heretofore. Individual tonnages are not large but come from many sources, reflecting a widespread move by consumers to build up their stocks in anticipation of higher prices. Restrictions on buying at present prices have been modified to the extent that most producers have lifted final dates on deliveries and have inserted clauses in all contracts stating that business is accepted subject to changes that may be in force at the time of shipment as a result of the National Industrial Recovery Act. In the meantime prices for all steel mill products are unchanged. The inflow of new steel business is larger than in any week either this year or in 1932.

Pig Iron

Shipments of Northern foundry iron continue to climb, though the upswing is not so sharp as in May. New buying is taking on more life, the week's business being the best in about a month. Increased foundry schedules for automobile castings are reflected in new business now reaching sellers. One merchant stack is in blast, with no immediate prospect of a second one being lighted. The Wells charcoal iron furnace is scheduled to be lighted next week. Southern iron is moving in greater volume into territory adjacent to Chicago. Prices are being set at Birmingham so as to save the buyer about 50c. a ton as compared with delivered prices on Northern iron.

Cast Iron Pipe

Only very small lots are being purchased and the new prices lack real tests. Sellers expect action soon by Chicago on 1400 tons, and Ann Arbor, Mich., is expected to close for 400 tons of 6, 8 and 12-in. pipe. All eyes are turned on Washington, where funds for construction work will soon be available.

Reinforcing Bars

This market has been exceedingly dull since the placing of the large tonnage for the Chicago Carton Co. Although there is some private business,

it is all small and the aggregate tonnage involved makes little impression on slack shop schedules. Road work is confined to a few county jobs in Illinois. Wisconsin has plans but is without funds, and Indiana is laboring under the same difficulty. The fight over cement prices in Illinois, instead of being settled, as appeared probable several weeks ago, is again raging.

Hot-Rolled Strip

Current prices are steady at 1.65c. to 1.70c. a lb. Most transactions are on the basis of 1.65c. for specification before July 1 and for delivery before July 15. Sellers will take third quarter business at 1.70c. if the buyer will agree to protect the seller under new conditions imposed by the industrial control act. Hot strip mills are producing at 35 per cent of capacity. Miscellaneous business is gaining steadily.

Cold-Rolled Strips

Prices are well established at 2c., Pittsburgh, and 2.30c. a lb., delivered Chicago. Local producers will accept third quarter contracts on this price basis if buyers will agree to a clause which protects sellers in accordance with future interpretations of the industrial control act. The industry is producing at 25 to 30 per cent of capacity.

Sheets

Output has reached 60 per cent of capacity, a gain of 10 points in a week. Most incoming business is miscellaneous in character and some of the tonnage is above actual immediate requirements of consumers.

Plates

Although large tonnages are lacking, there is a better run of small business, some of which is now coming from railroad shops.

Rails and Track Supplies

Although no actual rail programs are before the trade, nevertheless there is said to be more discussion in railroad circles as to probable requirements. Mill bookings in track fastenings are the heaviest so far this year.

Wire Products

An increasing part of current business is going into users' stocks and some wire sellers are openly questioning the effect that this will have on the market late in the summer and in the early fall. Members of the wire industry are meeting this week to

formulate a code for the industry. Prices remain steady and are in effect only for deliveries that can be made before the end of July.

Structural Material

Awards at 3000 tons are impressive, but inquiries have reached a new low. However, inquiries for work having Federal support are again appearing in the market.

Bars

Most bar mills in this district are now producing at 50 per cent of capacity or better. Needs by automobile manufacturers are undiminished and requirements of railroad shops and manufacturers of farm equipment are larger. Bar consumption among small miscellaneous shops has shown a steady increase in the past month.

Coke

By-product foundry coke has been advanced 50c. to \$7.50 a ton, local ovens. Commitments are not being made beyond the end of July.

Scrap

This market has a strong undertone, as evidenced by the fact that heavy melting steel is now quotable at \$8.75 to \$9 a ton. Dealers can buy most of their needs of this grade from \$8.75 up, reaching as high as \$9.25 for railroad scrap. Low phosphorus, borings and turnings are more active, and steel foundries in this district are in the market. Interest on the part of the steel castings makers is rather significant because they usually do not enter the scrap market unless they have orders for their products at hand.

Railroad offerings are slim, and as a result there is barely an adequate supply of the grades usually offered by them. The Milwaukee Road recently sold heavy melting steel, but it is not being shipped into the immediate Chicago district.

Manganese Steel Forge Co., of Philadelphia, has acquired the entire business and assets of the Audubon Wire Cloth Co., Inc., of Audubon, N. J.

The business will be conducted by the Audubon Wire Cloth Corp., a new organization and wholly owned subsidiary of the Manganese Steel Forge Co. The officers of the new corporation are: L. W. Jones, president; L. W. Jones, Jr., vice-president and treasurer; A. W. Zackey, secretary.

The heavy wire cloth and wire drawing departments of the Manganese Steel Forge Company, now producers of **ROL-MAN** manganese steel screens, will augment the Audubon Wire Cloth Corp.'s facilities. A comprehensive plan of modernization and expansion is already under way involving considerable new equipment.

Products of the company include a complete range of wire cloth for industrial, mechanical and commercial requirements in steel and all metals; spiral woven conveying belts for process industries; formed and fabricated wire products; trays and baskets. A specialty department manufacturing "strainer assemblies, radio parts and similar products utilizing wire cloth is working on a two-shift basis to meet the sudden spurt in demand of the electric refrigerator, automotive and radio industries.

Buyers Press for Deliveries in Eastern Pennsylvania

Sheet Mills Falling Behind on Shipments as Operations Gain—
Some Producers Suffer from Shortage of Skilled Labor

PHILADELPHIA, June 20.—Heavier specifications for steel have developed in this market. Consumers are covering more freely in order to avail themselves of second quarter prices, being convinced that higher levels will prevail in the third quarter. Mills are anxiously awaiting the set-up that will be established under the Industrial Recovery Act and are being besieged on this point by buyers. Meanwhile no commitments are being made beyond the end of the month. In the event a price policy is not determined before expiration of the second quarter, it may be decided to quote new prices for July only.

Mills are being pressed for delivery, especially of sheets, and some of them are being forced to defer shipments. Generally no second quarter prices are being granted on shipments beyond July 15. Some nearby tin plate, wire and sheet mills are operating at full capacity. The result has been a stepping up of open-hearth operations three points to about 26 per cent of capacity or slightly better.

There is no evidence of any considerable stocking of steel by consumers. On the contrary, indications are that material is going into immediate consumption.

It is reported that some railroads are taking stock of requirements and may come into the market for sizeable tonnages within six weeks or so. Meanwhile railroad buying remains at a low point.

A new note in the labor situation is the shortage of skilled workers at a nearby sheet mill. It is apparently due to the scattering of this kind of labor during the depression, but as the supply of workers becomes readjusted to changed conditions it is expected that no difficulty will be experienced in obtaining sufficient forces.

Pig Iron

The largest purchase of pig iron made in this district for several months took place the past week. It involved an unnamed but substantial tonnage of basic iron sold by an eastern Pennsylvania furnace to a nearby mill. The movement of both steel-making and foundry grades has increased. The melt at gray iron and malleable foundries is estimated to have moved up about 15 per cent during the past 10 days. Steel foundry activity, however, has shown but little improvement. Most furnace interests are quoting for third quarter delivery but are cautious in making commit-

ments, feeling that higher prices are a near-prospect in view of the Industrial Recovery Act and the likelihood of higher wages.

Plates, Shapes and Bars

Coverage at second quarter prices has been stimulated both because of immediate requirements and by reason of the uncertainty as to prices in the third quarter. The public works program is being awaited with interest, both mills and fabricators believing it will call for large tonnages, though not clear just how soon they can be placed. It is the plan of the Government, however, to push the projects as rapidly as possible. The Naval program for 32 ships is expected to develop steel requirements early in August. Large reinforcing bar tonnages will be required for the \$400,000,000 highway building program. Steel for the Pennsylvania Railroad pier at Baltimore has not as yet been

Mill Output Stepped Up in Cincinnati Area

CINCINNATI, June 20.—Despite lack of formal inquiry, pig iron bookings continue to average about 1000 tons a week. Total orders of Southern producers amounted to about 400 tons, of which 250 tons was from a central Indiana melter. Prices on Southern iron showed strength at present schedules and gave support to reports of probable early advances on silicon differentials. Other bookings, the past week, consisted of 200 tons of silvery for shipment to Indiana and scattered orders for single car lots. Speculative buying of pig iron is absent despite indications of possible price increases next quarter. Most consumers prefer to cover for 30-day needs without anticipating future requirements.

Coke

Firmness in other markets is giving rise to reports of impending advances on by-product foundry coke here. Ovens are resisting distant coverage. Current business is quiet, although shipments continue at good rate.

Steel

Renewal of demand from small interests, together with the steadiness of specifications from other users, raised mill bookings, the past week, to better than 50 per cent of capacity.

let by the general contractors, Sinclair & Grigg. It calls for about 4000 tons of shapes, 1400 tons of plates and 1500 tons of reinforcing bars.

Sheets

Mills are being pressed increasingly for deliveries, chiefly by automotive makers, and have been forced to defer shipments somewhat. The electric refrigerator and radio industries are buying more freely. Some nearby mills are operating at capacity and all are producing at a high rate.

Warehouse Business

The recent improvement in demand is being maintained. The outstanding requirement is for corrugated galvanized sheets.

Imports

The following iron and steel imports were received here last week: 50 tons of iron ore from England, 10 tons of steel bands and 10 tons of structural shapes from Belgium, 6 tons of hollow drill steel from Norway and 1 ton of ferrotitanium from Italy.

Scrap

The market is comparatively quiet, but No. 1 blast furnace scrap and cast borings for blast furnace use have moved up to \$5, furnace, on the strength of sales.

Rolling schedules have been stepped up to 55 per cent of normal activity.

Scrap

Withdrawal of the Louisville & Nashville railroad list, while disappointing local dealers, tended to add strength to the market. Dealings are still confined to small orders, since scarcity of material is making dealers wary. Bids on several important items have been advanced 25 to 50c. in a further effort to thaw "frozen" material.

More Scrap Moving Out of Detroit

DETROIT, June 20.—The local scrap market has been fairly active the past week, although most buying of steel grades has been by mills outside this district. More scrap is reported moving out of Detroit to other steel centers than at any time since the local steel plant began operating late in 1930. Much of it is going by water to Cleveland and thence by rail to the Youngstown district. Buffalo steel interests are said to be considering making scrap purchases here for the first time in more than a year. The local mill has a comfortable supply of material on hand and is placing orders only when it has an opportunity to pick up scrap at less than the established market. With the exception of a gain of 25c. a ton in sheet clippings, prices are unchanged.

Steel Bookings Mount in New York District

Buyers Specify Heavily Against Second Quarter Contracts— Bids on 17 Navy Vessels to Be Taken July 26

NEW YORK, June 20.—The approach of June 30 is causing steel buyers to increase their specifications against second quarter contracts. Consumers have every incentive to build up stocks of steel in view of the certainty of price advances, but they are checked in many cases by definite quantity limits in their contracts or by lack of money. The credit situation is still a definitely restrictive factor in the steel market. In most cases where buyers contracted for their second quarter "requirements" they will no doubt be prevented from specifying excessively by the unwillingness of the producers to encourage speculative purchases. Deliveries will also tend to hold down commitments of this kind. On most steel products the mills are accepting specifications only for delivery by the middle of July.

There is no gainsaying that the characteristics of a strong seller's market are making their appearance. Rush orders are being placed and on some products certain mills are now behind on deliveries. A telegraphic order for 2000 tons of plates for car repair work suggests that increasing freight traffic is wiping out car surpluses. Railroads generally are commencing to purchase steel in anticipation of increased shop requirements. Mills rolling heavy products, which have heretofore been relatively inactive, will benefit from the Government's new Naval construction program. Of the 32 warships authorized, the Navy will take bids from private yards on 17 of them on July 26. The remaining 15 will be assigned by the Secretary of the Navy to Government Navy Yards for construction. In addition to a heavy tonnage of plates, shapes and bars, these vessels will involve a considerable outlay for high-quality materials, including stainless steels, alloy steels and armor plate.

The Bull Steamship Line, Inc., has placed two freight vessels, requiring a total of 6000 tons of plates, with the Newport News Shipbuilding & Dry Dock Co., which has bought the steel. The Frederick Snare Corp., New York, general contractor, has awarded the fabricated steel for the Rip Van Winkle bridge, Catskill, N. Y., 12,000 tons, to the Harris Structural Steel Co. No action has yet been taken on 1000 tons of riveted pipe for the foundations of the bridge or on 500 tons of steel pipe for the superstructure. The award of 10,000 tons of plates, shapes and bars for the Texas City, Tex., refinery of the Pan American Petroleum

& Transport Co. is expected to be made this week.

Mills still refuse to quote for third quarter except with a saving clause stipulating that prices will be advanced if costs increase under the provisions of the Industrial Recovery Act. The final date for acceptance of specifications against current commitments is June 30, except on wire products on which buyers may specify until July 31 for delivery before Aug. 15, and on tin plate on which most large consumers are covered by contract until fall.

The New York Central opened bids on its third quarter steel requirements June 20. Mills quoted for July only, expressly stipulating that their prices would not apply on any steel shipments after July 31.

Pig Iron

Trading has quieted down. Sales for the week totaled about 3000 tons, compared with 3500 tons in each of the two preceding periods. Forward buying is still retarded by the uncertainty of future labor and materials costs. Furnaces are particularly hesitant about quoting for shipment beyond third quarter. There is some talk of instituting a clause in pig iron contracts to provide for price revisions in the event that operating and raw materials costs should be increased as a result of the industrial control bill. Melters, on the other hand, are not yet manifesting much interest in forward commitments. While a general improvement in foundry activity has been experienced in the past month, the expansion in melt has not been in proportion to the relatively heavy buying movement last month. Large melters are generally covered through third quarter, while smaller users continue to buy against spot needs. The American Radiator Co. will light its furnace at Tonawanda, N. Y., this week, and the low phosphorus producer at Standish, N. Y., plans to blow in its stack in July. Buffalo and eastern Pennsylvania producers are holding firmly to base price schedules. Foreign quotations are subject to daily fluctuations in exchange.

Reinforcing Bars

With no increase in private construction additional bar specifications will depend upon the projected public works program. Prices remain steady. The Pennsylvania Railroad will prob-

ably purchase direct 1400 tons for piers at Baltimore. Bids will be opened June 26 for 2300 tons for bridge work at Jones Beach, N. Y. Lettings for the week total about 1400 tons, of which 1200 tons went to Kalman Steel Corp. for the Rip Van Winkle Bridge. Pending tonnage involves construction of Lebanon Hospital in New York, warehouses in Brooklyn and about 750 tons for New York Central viaduct in New York.

Scrap

Fresh buying is meager. Brokers are apparently limiting their offerings in the belief that higher prices will be realized when the recovery act gets into full swing. Active demand from steel makers and the leading radiator manufacturer has stimulated a 50c. a ton advance in stove plate. All other grades are nominally strong. Foreign buyers are reported to be actively interested in further tonnages of heavy melting steel but have not yet indicated a willingness to bid for scrap on a parity with prices prevailing for domestic shipment. Meanwhile, loading against old export orders continues at unchanged prices.

Further Advances in Scrap at St. Louis

ST. LOUIS, June 20.—There was a lull in buying of foundry pig iron during the last week, largely because of the fact that many melters are covered on their requirements for the present. Buying of basic iron has not yet begun on any extensive scale. Makers are not quoting prices for fourth quarter delivery. Prices are firm and unchanged.

Steel

Demand for sheets, wire products and other light steel is being well maintained. Structural buying is light, all factors awaiting the expected heavy demand for Government projects.

The Missouri Pacific Railway award of 1550 tons of structural steel for bridge repair work went to the American Bridge Co. The St. Louis Structural Steel Co. was awarded 150 tons of tanks for the Granite City Brewery.

Scrap

An East Side mill bought a round tonnage of heavy melting steel during the week, and other mills are said to be negotiating for scrap. Railroad springs, cast iron borings and shoveling turnings, and machine shop turnings are 50c. higher, and bundled sheets and wrought iron bars and transoms are \$1 up. The Louisville & Nashville withdrew its list of 35,000 tons because of unsatisfactory prices offered.

Steel Output Rises to 67 Per Cent in Northern Ohio

Some Mills Unable to Keep Up With Customers' Demands, Forcing Them to Seek Additional Sources of Supply

CLEVELAND, June 20.—The pace that has been set in the demand for finished steel is being maintained, and business placed in this territory during June will show some gain over May. Ingot output in the northern Ohio territory increased four points this week, now being 67 per cent of capacity. Cleveland plants are running at 56 per cent of capacity. The Corrigan McKinney Steel Co. has put on an additional open-hearth furnace, now operating 12, and Lorain with the addition of one is operating all 12. Because of its increase in finishing mill operations, a Lorain plant is unable to supply all the semi-finished steel needed by a Cleveland plant and the latter is securing shipments of semi-finished material from Pittsburgh. An additional blast furnace has been put on in Lorain, three out of five now operating.

Demand from the automotive industry is holding at recent volume and is expected to be well maintained through July. Automobile companies in the Detroit territory are pressing the mills for third quarter prices. While there evidently has not been much speculative buying in the expectation of higher prices, heavy orders are looked for during the remainder of June against second quarter contracts. Demand for tin plate continues heavy.

With uncertainty as to the increase in costs that will result from the enforcement of the Industrial Recovery Act, steel companies are still refraining from quoting prices for the third quarter. Some producers will enter orders for bars, plates, shapes and hot-rolled strip for shipment at the mills' convenience after July 1 at present prices, but subject to any upward revision that may be warranted by increases in production costs. Some of the sheet makers also expect to open their books this week at the recently announced higher prices but which were later withdrawn. However, these prices also will be subject to revision.

The only definite price announcement is an advance on rivets, and the reestablishment of present prices on bolts and nuts, the prices named on these products being for July only.

Pig Iron

Sales and inquiry gained the past week and shipping orders also improved. Shipments continue heavy to

the motor car industry and are expected to be heavier during the last half of June than during the first half. One Cleveland interest sold 5000 tons during the week, including a 2000-ton lot of foundry and malleable iron. Some inquiry is coming from foundries that did not cover for their full third quarter requirements when they bought recently, and considerable inquiry for the fourth quarter is coming out. However, furnaces are not yet quoting for that delivery. Prices are firm.

Sheets

Releases from the automotive industry continue heavy and the refrigerator manufacturers are still taking good tonnage. Demand from stove manufacturers has improved. Some of the steel barrel manufacturers are operating better than recently. Producers are taking orders at the old prices for delivery up to July 15 but generally have not named prices for the third quarter. However, it is expected that in a day or two prices previously named by some makers will be placed in effect for July, but will be subject to change. These are 2.25c. for No. 24 hot-rolled annealed and 2.60c. for auto body sheets, an advance of \$3 a ton over prices at which current orders are being taken.

Strip Steel

Orders from the automotive industry are still heavy and there is a good miscellaneous demand. Automobile plants are crowding for deliveries and some mills are filled up for three weeks on cold-rolled strip. While shipments are still being made against old lower price contracts, new business for early shipment is being taken at 1.55c. for hot-rolled strip and 1.80c. to 2c. for cold-rolled material. Makers have not named third quarter prices.

Iron Ore

Ore firms have closed with many consumers having long-term contracts for ore for their 1933 requirements and these have materially increased their shipping schedules over last year. The Pittsburgh Steamship Co., United States Steel Corp'n. subsidiary, will place 12 to 15 additional boats in commission shortly. Consumption of Lake Superior ore during May amounted to 1,265,623 tons, a gain of 493,651 tons over April. This was a considerable gain over May last year, when 918,321 tons were consumed. Furnace stocks June 1 amounted to

23,407,464 tons and ore at furnaces and Lake Erie docks amounted to 28,314,417 tons, as against 32,699,957 tons on June 1 last year. Central district furnaces used 723,124 tons of ore in May, an increase of 263,747 tons over April, and Lake front furnaces used 540,691 tons, a gain of 228,784 tons over the previous month. Eastern furnaces consumed 1808 tons, an increase of 1120 tons. There were 55 furnaces in blast using Lake ore May 31, an increase of 13 for the month.

Bars, Plates and Shapes

Demand for merchant bars continues heavy and reinforcing bars are more active. The city of Cleveland has placed 1240 tons for the Parma reservoir, the steel for which will be rolled by a local mill, and has asked for bids for a garbage disposal plant taking 250 tons. Structural inquiry continues light. A Chesapeake & Ohio Railroad bridge in Cincinnati, requiring 600 tons, has been placed. As fabricators are unable to secure price protection on steel for specific jobs, they will probably make their bids and contracts subject to any advance they may have to pay for plain material. Plates are in fairly active demand.

Bolts, Nuts and Rivets

Bolt and nut manufacturers have reaffirmed the present 73 per cent discount for July and will take orders at that price for shipment to about Aug. 10. Rivet manufacturers have advanced prices 25c. per 100 lb. to \$2.50 and small rivets to 70, 10 and 5 for July shipment only. Tire bolts and hot-galvanized machine bolts have been advanced from 60 and 10 per cent off list to 60 per cent discount, and elevator and step bolts from 73 to 70 per cent discount, these prices being for July shipment only.

Scrap

The market has a firmer tone, and prices have advanced 50c. a ton on blast furnace scrap and some steel-making grades. Activity is largely in steel-making scrap. Present mill operations permit consumers to take good tonnages against contracts. Considerable scrap continues to come to Cleveland by water, largely from Lake Michigan ports. One cargo of Canadian scrap has reached here.

Railroad Equipment

Board of Transportation, New York, has advertised for bids on six motor and six trailer trucks.

Lehigh & New England has converted 60, 50-ton hopper cars at Pen Argyl, Pa., into specially designed bulk cement cars. Authorized conversion of 20 additional cars has been made, and material for 20 more cars may be ordered.

Chicago, Burlington & Quincy will purchase three-car articulate high-speed passenger train of stainless steel construction and powered with Diesel-electric equipment.

Pig Iron and Scrap Are Quiet at Boston

BOSTON, June 20.—Pig iron sales took a decided drop the past week, aggregating not more than 500 tons. Indications are that bookings will be larger this week, although not a great deal, since all tonnages in private negotiations are comparatively small and there is no open inquiry of any importance. However, New England melt is slowly yet steadily increasing. A number of fairly important foundries are handicapped in purchases by poor financial standing. Prices are holding firm.

Scrap brokers apparently have more orders to work on, but when it comes right down to confirmation of orders, sellers usually decide not to part with their material. This attitude has been especially conspicuous this week because of a reported advance in No. 1 heavy melting steel scrap in the Pittsburgh territory. The market here for that material is \$5.50 to \$5.75 a ton, on cars shipping point, with \$5.65 the predominating price.

Pig Iron Output to Be Increased at Buffalo

BUFFALO, June 20.—The Tonawanda Iron Corp'n. furnace is definitely due to go in this week. Preparations are being made to place in blast the Port Colborne, Ont., furnace of Canadian Furnace Co., Ltd. Furnaces at the Republic Steel Corp'n. and the Hanna Furnace Corp'n. are being prepared. Pig iron sales have been in medium volume this past week.

Steel

The Lackawanna plant of the Bethlehem Steel Corp'n. has increased the number of its active open-hearthers from eight to 12. The Republic Steel Corp'n. is operating four, including one 200-ton furnace, and Wickwire-Spencer is operating one. Operations of the Seneca sheet division of Bethlehem have been increased from 50 to 60 per cent of capacity. Structural business is quiet; one 70-ton bridge in Erie County has not yet been awarded. Reinforcing bar business is featureless except for a pickup in small-lot orders.

Scrap

Water-borne scrap is coming into Buffalo. One boatload of No. 1 machinery cast from Montreal was delivered at approximately \$10 to \$10.50, Buffalo, and a 500-ton lot of stove plate was delivered at \$8.50, Buffalo, over the barge canal from Eastern points. Demand has increased for blast furnace scrap in view of prospective expansion of pig iron output. Prices are firm. A large interest which purchased heavy melting steel recently for \$10 and which later

dropped its offering price to \$9 is now offering \$9.50. Dealers' ideas on No. 1 heavy melting steel are that more than \$10 should be obtained.

Bids to Be Asked on 17 War Vessels

WASHINGTON, June 20.—Bids will be opened July 26 by the Navy Department on 17 ships. They include two aircraft carriers, one heavy cruiser, one light cruiser, 11 destroyers and two submarines. All of these vessels will be built at private yards. They are included in the list of 32 ships to be built under the public works program; the remaining 15 to be constructed at Navy yards.

Cast Iron Pipe

Massachusetts closes bids July 5 on 6900 ft. of 10-in., 20,600 ft. of 12-in. and 22,775 ft. of 16-in.

Sturbridge, Mass., closes bids June 27 on 20,000 ft. of 6- and 8-in.

New York City has divided about 300 tons of 8 and 12-in. between United States Pipe & Foundry Co. and Central Foundry Co.

Anne Arundel County Sanitary Commission, Annapolis, Md., will install about 9000 ft. pipe for water service in connection with new system in Pines district.

Cleveland plans extensions in water mains in different parts of city, including 15 to 20 miles of 36-in., entire project to cost over \$1,000,000. G. W. Hamlin, City Hall, is engineer.

Ann Arbor, Mich., will buy 400 tons of 6, 8 and 12-in.

City Council, San Diego, Cal., and Board of County Supervisors are arranging program for public works construction, including extensions and improvements in pipe lines for water supply in different parts of city and county, to cost over \$225,000.

Snohomish, Wash., has bought 123 tons in open market.

Seattle has awarded 1350 tons of 20-in. to United States Pipe & Foundry Co.

South Pasadena, Cal., has awarded 150 tons of 10-in. to R. D. Wood & Co.

San Francisco will take bids June 23 on 1595 tons of 6 and 8-in., class 150.

Los Angeles will take bids on June 26 on 7800 tons of 6, 8 and 12-in.; delivery to be made during next fiscal year.

Rails

Seattle has awarded 500 tons of rails to Pacific Coast Steel Corp'n.

Norfolk & Western has placed 10,000 tons of rails, 7500 tons with Carnegie Steel Co. and 2500 tons with Bethlehem Steel Co.

Seaboard Air Line has divided 11,470 tons of rails between Tennessee Coal, Iron & Railroad Co. and Bethlehem Steel Co.

Tyson Roller Bearing Corp'n. of Massillon, Ohio, has published anti-friction bearing recommendations and engineering data for application of Tyson cageless tapered roller bearings in mine cars and quarry cars, with both through and stub axles, inside and outside boxes.

Bethlehem Opens Sales Office at Houston

Bethlehem Steel Co. will open a district sales office at Houston, Tex., on July 1, with J. E. Moore as district manager of sales. The office will be in the Petroleum Building, Texas Avenue and Austin Street. The district will include the State of Texas and all of Louisiana, except those parishes which lie east of the eastern boundaries of St. Landry, St. Martin and Iberia.

Washington Organizes for Business

(Concluded from Page 1001)

labor when codes are up for hearing. Codes drawn carry labor provisions of the act, giving, as the President said, rights never before enjoyed by labor. President Green of the American Federation of Labor has called upon organized labor to cooperate in an effort to make the law a success but also has announced that the Federation would call upon workers of the nation to organize and unite "in order to secure for themselves all the economic and social benefits provided in the recovery act." Labor's position in the Industrial Administration is strong. For his counsellor, General Johnson has Donald R. Richberg, former counsel for the railroad brotherhoods, which are standing firmly against a 12½ per cent slash in railroad wages. Another assistant is Edward F. McGrady, former legislative agent for the American Federation of Labor. There are other organized labor representatives with the administration. It is also true, however, that the administration has selected many prominent industrialists as aids.

It is also true that even those most strongly opposed to the closed shop, who fear that organized labor will seek to use the labor provisions of the Industry Recovery Act to unionize industry, are convinced of the announced purpose of General Johnson not to permit labor or industry to take advantage of the law to promote the selfish interest of either. The question in the minds of those who are apprehensive over widespread unionization of industry is whether General Johnson can prevent it in view of his multiplicity of activities.

The fact remains that union membership, little known to the public, has grown greatly in the past few weeks and it is evident organized labor is placing itself in a numerical and tactical position to demand higher wages. At the same time organized labor leaders apparently have taken the attitude that they must not ask too much. They also appear to be chary lest labor racketeers take advantage of the law.

Tin and Lead Enjoy Brisk Demand Following Temporary Lull

Zinc Firms on Steady Covering; Fresh Buying of Copper Still Lags, Though Movement to Consumers Gains Pace

NEW YORK, June 20.—With the Industrial Recovery Act finally enacted, the copper industry is devoting its interest chiefly to formulating a code of practice for submission to Washington. The industry's selling and producing policies are still in a tentative stage. A central committee is reported to have been appointed at a recent meeting here to represent the industry in aligning its future program with the administration's industrial control bill. Marketwise, copper has remained a drab affair. Electrolytic, at 8c. lb.; Connecticut, has been virtually neglected for the past 10 days. Scattered lots for spot delivery are still available at concessions of $\frac{1}{8}$ c. to $\frac{3}{8}$ c. a lb. Movement of copper against old orders continues to gather momentum, and in some cases consumers have anticipated their requirements as far ahead as August.

Failure of the international confer-

ence at London to check price strength in the United States has aroused buying interest in European markets. Today a substantial volume of business was transacted at prices equivalent to 7.50c. to 7.75c., c.i.f. usual Continental ports. Earlier in the seven-day period Continental values hovered around 7.40c.

Tin

The unfounded reports from London of an agreement to stabilize the dollar caused a temporary slump last week in tin prices, which on Friday fell to 43.05c. a lb., New York, for spot Straits, and about 40c. for English refined. Subsequent denial by Washington authorities that any stabilization agreement had been reached effected a reversal in the course of prices. Today, with sterling quoted at a record high level for the recent movement, spot Straits jumped to 44.95c. a lb. American consumers,

who bought only moderately on the decline, greeted the rebounding market with a spirited demand, and buying today again reached the heavy volume that prevailed two weeks ago. Professional trading was also in greater evidence. Price fluctuations on the London Metal Exchange during the week were also sharp, as exemplified by spot standard, which opened yesterday at £216 and closed this afternoon at £225. Future standard today was quotable at £224 15s., and spot Straits at £244. The Singapore market lost ground during the week, closing today at £240 7s. 6d., compared with £242 5s. a week ago. Withdrawal last week of 927 tons, the bulk of which left Liverpool on Saturday for American delivery, sent United Kingdom warehouse stocks down to 22,662 tons. Straits shipments for the first half of June totaled 3627 tons.

Lead

After a relatively dull week, this market today was enlivened by a renewal of heavy inquiry. The sudden spurt in interest is attributed to rising markets in London and news of unchecked buoyancy in prices here. Current demand is therefore largely speculative and does not represent actual consuming needs. Lead users are practically covered for their estimated requirements during June and July. Producers with substantial bookings for those months are now inclined to consider limited quantities for August delivery, although books will not be officially opened for August business until next week. Prices are very firm at 4.05c. a lb., St. Louis, and 4.20c., New York. May statistics disclosed an unexpected increase in smelters' stocks of 291 tons. This increase, however, grew out of the expansion in secondary metal production, which amounted to about 9000 tons. Primary production in May was 28,488 tons, while shipments aggregated 28,197 tons. Based on bookings for June, foreshadowing shipments of nearly 30,000 tons, and the expectation that lead scrap supplies are practically dried up, statistics at the close of this month are expected to show a definite decrease in smelters' holdings.

Zinc

Prices have advanced \$2 a ton during the past week, and the market today is established at 4.35c. a lb., East St. Louis, or 4.72c., New York. The chief impulse for the price advance was provided by a sustained demand from consumers. Sales volume for the week, while not matching that in the preceding period, was considered to be satisfactory in view of the fact that most consumers are covered substantially through July. The Joplin ore market is firm at \$30 a ton. Ore stocks at the close of last week fell to a record low level of 15,000 tons.

The Week's Prices. Cents Per Pound for Early Delivery

	June 14	June 15	June 16	June 17	June 19	June 20
Electrolytic copper, N. Y.*	7.75	7.75	7.75	7.75	7.75	7.75
Lake copper, New York	8.00	8.00	8.00	8.00	8.00	8.00
Straits tin, Spot, N. Y.	44.95	43.12½	43.05	44.62½	44.95
Zinc, East St. Louis	4.25	4.25	4.25	4.30	4.30	4.35
Zinc, New York	4.62	4.62	4.62	4.67	4.67	4.75
Lead, St. Louis	4.05	4.05	4.05	4.05	4.05	4.05
Lead, New York	4.20	4.20	4.20	4.20	4.20	4.20

*Refinery quotations; price $\frac{1}{8}$ c. higher delivered in Connecticut.

Aluminum, 98 to 99 per cent pure, 22.90c. a lb., delivered.
Nickel electrolytic cathode, 35c. a lb., delivered; shot and ingot, 36c. a lb., delivered.
Antimony, 6.50c. a lb., New York.
Brass ingots, 85-5-5-5, 8c. a lb., New York and Philadelphia.

From New York Warehouse

Delivered Prices, Base per Lb.

Tin, Straits pig.	47.00c. to 48.00c.
Tin, bar	49.00c. to 50.00c.
Copper, Lake	9.00c. to 9.75c.
Copper, electrolytic	8.75c. to 9.25c.
Copper, castings	8.50c. to 9.50c.
Copper sheets, hot-rolled	15.62½c.
*High brass sheets	13.25c.
*Seamless brass tubes	14.87½c.
*Seamless copper tubes	15.12½c.
*Brass rods	10.75c.
Zinc, slabs	5.50c. to 6.00c.
Zinc sheets (No. 9), casks	9.25c. to 9.50c.
Lead, American pig.	4.87½c. to 5.87½c.
Lead, bar	6.25c. to 7.25c.
Lead, sheets	7.75c.
Antimony, Asiatic	8.00c. to 9.00c.
Alum., virgin, 99 per cent plus	22.30c.
Alum. No 1 for remelting, 98 to 99 per cent	18.00c. to 19.00c.
Solder, $\frac{1}{2}$ and $\frac{1}{4}$	29.00c. to 30.00c.
Babbitt metal commercial grade	25.00c. to 50.00c.

*These prices are also for delivery from Chicago and Cleveland warehouses.

From Cleveland Warehouse

Delivered Prices per Lb.

Tin, Straits pig.	48.50c.
Tin, bar	50.50c.

Copper, Lake	9.12½c.
Copper, electrolytic	9.12½c.
Copper, casting	8.50c.
Zinc, slab	5.75c. to 6.00c.
Lead, American pig.	5.35½c. to 5.50c.
Lead, bar	8.50c.
Antimony, Asiatic	8.50c.
Babbitt metal, medium grade	18.50c.
Babbitt metal, high grade	52.50c.
Solder, $\frac{1}{2}$ and $\frac{1}{4}$	27.00c.

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	6.50c.	7.00c.
Copper, hvy. and wire	6.25c.	6.625c.
Copper, light and bottoms	5.00c.	5.625c.
Brass, heavy	3.50c.	4.00c.
Brass, light	2.75c.	3.50c.
Hvy. machine composition	4.75c.	5.25c.
No. 1 yel. brass turnings	4.00c.	4.50c.
No. 1 red brass or compos. turnings	4.75c.	5.00c.
Lead, heavy	3.25c.	3.75c.
Zinc	2.25c.	2.75c.
Cast aluminum	6.50c.	7.50c.
Sheet aluminum	11.75c.	13.50c.

Prices of Finished and Semi-Finished Steel, Coke, Coal, Cast Iron Pipe

BARS, PLATES, SHAPES

Iron and Steel Bars

Soft Steel

	Base per Lb.
F.o.b. Pittsburgh mill	1.60c.
F.o.b. Chicago	1.70c.
Del'd Philadelphia	1.91c.
Del'd New York	1.95c.
Del'd Detroit	1.80c.
F.o.b. Cleveland	1.65c.
F.o.b. Lackawanna	1.70c.
F.o.b. Birmingham	1.75c.
C.I.F. Pacific ports	2.10c.

Billet Steel Reinforcing

(Cut lengths as quoted by distributors)	
F.o.b. P'gh mills	1.75c.
F.o.b. Birmingham	1.75c.
F.o.b. Cleveland	1.75c. to 1.90c.

Rail Steel

F.o.b. mills, east of Chicago dist.	1.50c.
F.o.b. Chicago Heights mills	1.50c.

Iron

Common iron, f.o.b. Chicago	1.60c.
Refined iron, f.o.b. P'gh	2.75c.
Common iron, del'd Philadelphia	1.85c.
Common iron, del'd New York	1.90c.

Tank Plates

	Base per Lb.
F.o.b. Pittsburgh mill	1.50c. to 1.60c.
F.o.b. Chicago	1.70c.
F.o.b. Birmingham	1.75c.
F.o.b. Lackawanna	1.70c.
F.o.b. Bethlehem	1.70c.
Del'd Cleveland	1.8035c.
Del'd Philadelphia	1.4935c. to 1.5935c.
F.o.b. Coatesville	1.40c. to 1.50c.
F.o.b. Sparrows Point	1.40c. to 1.50c.
Del'd New York	1.595c. to 1.695c.
C.I.F. Pacific ports	2.00c.
Wrought iron plates, f.o.b. P'gh	3.00c.

Structural Shapes

	Base per Lb.
F.o.b. Pittsburgh mill	1.60c.
F.o.b. Chicago	1.70c.
F.o.b. Birmingham	1.75c.
F.o.b. Lackawanna	1.70c.
F.o.b. Bethlehem	1.70c.
Del'd Cleveland	1.8035c.
Del'd Philadelphia	1.4935c. to 1.5935c.
Del'd New York	1.595c. to 1.695c.
C.I.F. Pacific ports (standard)	2.10c.
C.I.F. Pacific ports (wide flange)	2.20c.

Steel Sheet Piling

	Base per Lb.
F.o.b. Pittsburgh	1.90c.
F.o.b. Chicago mill	2.05c.
F.o.b. Buffalo	2.00c.

Alloy Steel Bars

(F.o.b. Pittsburgh, Chicago, Buffalo, Massillon or Canton.)	
Alloy Quantity Bar Base.	
S.A.E.	2.45c. to 2.65c. per 100 Lb.
Series	
Numbers	
2000 (1/2% Nickel)	\$0.25
2100 (3/4% Nickel)	0.55
2200 (3/4% Nickel)	1.50
2500 (5% Nickel)	2.25
3100 Nickel Chromium	0.55
3200 Nickel Chromium	1.35
3300 Nickel Chromium	3.80
3400 Nickel Chromium	3.20
4100 Chromium Molybdenum (0.16 to 0.25 Molybdenum)	0.50
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum) (1.50 to 2.00 Nickel)	1.05
5100 Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100 Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100 Chromium Spring Steel	0.20
6100 Chromium Vanadium Bar	1.20
4100 Chromium Vanadium Spring Steel	0.95
9250 Silicon Manganese Spring Steel (nickel)	0.25
Rounds and Square	0.50
Chromium Nickel Vanadium	1.50
Carbon Vanadium	0.95

Above prices are for hot-rolled steel bars forging quality. The differential for cold-drawn bars is 1/2c. a lb. higher, with standard classification for cold-finish alloy steel bars applying. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis. Billets under 4 x 4 in. carry the steel bar base. Slabs with a section area of 16 in. or over carry the billet price. Slabs with sectional area of less than 16 in. or less than 2 1/2 in. thick, regardless of sectional area, take the bar price.

Cold Finished Bars*

Bars, f.o.b. Pittsburgh Mill	1.70c.
Bars, f.o.b. Chicago	1.75c.
Bars, Cleveland	1.75c.
Bars, Buffalo	1.75c.
Bars, Detroit	1.95c.
Bars, eastern Michigan	1.95c.
Shaping, ground, f.o.b. mill	
1-3/16 to 1 1/2 in.	3.00c.
1-9/16 to 1 3/4 in.	2.55c.
1-15/16 to 2 in.	2.30c.
2-15/16 to 2 3/4 in.	2.05c.

* In quantities of 10,000 to 19,999 lb.

SHEETS, STRIP, TIN PLATE

TERNE PLATE

Sheets

Hot-Rolled

No. 10, f.o.b. Pittsburgh	1.50c. to 1.65c.
No. 10, f.o.b. Chi'o mill	1.60c. to 1.75c.
No. 10, del'd Philadelphia	1.81c. to 1.96c.
No. 10, f.o.b. Birmingham	1.65c. to 1.80c.
No. 10, c.i.f. Pacific Coast ports	2.12 1/2c.

Hot-Rolled Annealed

No. 21, f.o.b. Pittsburgh	2.10c. to 2.25c.
No. 21, f.o.b. Chi'o mills	2.20c. to 2.35c.
No. 24, del'd Philadelphia	2.41c. to 2.56c.
No. 24, f.o.b. Birmingham	2.25c. to 2.40c.
No. 24, c.i.f. Pacific Coast ports	2.75c.
No. 24, wrought iron, Pittsburgh	4.30c.

Heavy Cold-Rolled (Mill Run)

No. 10, f.o.b. Pittsburgh	1.80c. to 1.95c.
No. 10, f.o.b. Chi'o mills	1.90c. to 2.05c.
No. 10, del'd Phila.	2.11c. to 2.26c.
No. 10, c.i.f. Pacific Coast ports	2.70c.

Light Cold-Rolled (Mill Run)

No. 20, f.o.b. Pitts'h	2.25c. to 2.40c.
No. 20, f.o.b. Chi'o mills	2.35c. to 2.50c.
No. 20, del'd Phila.	2.56c. to 2.71c.
No. 20, c.i.f. Pacific Coast ports	2.95c.

Auto Body and Steel Furniture

No. 10, f.o.b. Pittsburgh	2.00c. to 2.15c.
No. 20, f.o.b. Pittsburgh	2.45c. to 2.60c.
No. 20, f.o.b. Chicago	2.55c. to 2.70c.

Galvanized Sheets

No. 24, f.o.b. Pittsburgh	2.70c. to 2.85c.
No. 24, f.o.b. Chi'o mills	2.80c. to 2.95c.
No. 24, del'd Philadelphia	3.18c.
No. 24, f.o.b. Birmingham	2.85c.
No. 24, c.i.f. Pacific Coast ports	3.35c.
No. 24, wrought iron, Pittsburgh	4.95c.

Long Terme

No. 21, unassorted, 8-lb. coating	
f.o.b. Pittsburgh	2.75c. to 2.90c.

Vitreous Enamel Stock

No. 20, f.o.b. Pittsburgh	2.90c.
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Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	2.30c.
No. 28, Chicago mill	2.40c.

Tin Plate

	Base per Box
Standard cokes, f.o.b. P'gh district mill	\$4.25
Standard cokes, f.o.b. Gary	4.35

Terne Plate

(F.o.b. Morgantown or Pittsburgh)	
(Per Package, 20 x 28 in.)	
8 lb. coating I.C.	\$8.70
15-lb. coating I.C.	11.00
20-lb. coating I.C.	11.90
25-lb. coating I.C.	13.00
30-lb. coating I.C.	13.80
40-lb. coating I.C.	15.30

Hot-Rolled Hoops, Bands, Strips and Flats under 1/4 in.

	Base per Lb.
All widths up to 24 in., Pittsburgh	1.55c. to 1.60c.
All widths up to 24 in., Chicago	1.65c. to 1.70c.
Cooperage stock, P'gh	1.55c. to 1.60c.
Cooperage stock, Chicago	1.65c. to 1.70c.

Cold-Rolled Strips

F.o.b. Pittsburgh	2.00c.
F.o.b. Cleveland	1.80c. to 2.00c.
Del'd Chicago	2.30c.
F.o.b. Worcester	2.15c.
Fender stock, No. 20 gage, Pittsburgh	
Cleveland	2.60c. to 2.85c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland.)
Extras of 10c. a 100 lb. on mixed and joint carloads, 20c. on pool carloads and 30c. or less than carloads are applied on all merchant wire products. In carloads and mixed carloads a discount of 10 per cent on extras is allowed.

To Manufacturing Trade

Bright wire	2.10c.
Spring wire	3.10c.

To Jobbing Trade

	Base per Keg
Standard wire nails	\$1.85
Smooth coated nails	1.85
Galvanized nails	3.35
Smooth annealed wire	\$2.25
Smooth galvanized wire	2.60
Polished staples	2.55
Galvanized staples	2.80
Barbed wire, galvanized	2.35

Woven wire fence No. 9 gage, base column, per net ton \$50.00

Chicago and Anderson, Ind., mill prices are \$1 a ton over Pittsburgh base; Duluth, Minn., and Worcester, Mass., mill \$2 a ton over Pittsburgh, and Birmingham mill \$3 a ton over Pittsburgh.

STEEL AND WROUGHT PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio Mills

Butt Weld

Inches	Black Galv.	Wrought Iron
1/4	55 33	1/4 + 9 1/4 + 13 1/2
3/4	60 41	3/4 + 1 1/2 + 21 1/2
1	65 54	1 + 3 1/2 + 26 1/2
1 1/4	69 59	1 1/4 + 3 1/2 + 26 1/2
1 3/4	71 62	1 3/4 + 4 1/2 + 28
2		2 + 4 1/2 + 28

Lap Weld

2	66	57	2	97	22½
2½ to 6..	69½	60½	2½ to 3½	38	25
7 and 8 ..	68	58	4 to 8 ..	40	28½
9 and 10..	67	57	9 to 12..	38	24½
11 and 12..	66	56			

Skelp	
(F.o.b. Pittsburgh or Youngstown)	
	Per Lb.
Grooved	1.60c.
Universal	1.60c.
Sheared	1.60c.

Wire Rods	
(Common soft, base)	
	Per Gross Ton
Pittsburgh	\$35.00
Cleveland	35.00
Chicago	36.00

COKE, COAL AND FUEL OIL

Coke	
	Per Net Ton
Furnace, f.o.b. Connellsville	\$1.75 to \$2.25
Prompt	
Foundry, f.o.b. Connellsville	2.50 to 4.00
Prompt	
Foundry, by-product, Chicago arena, for delivery outside switching districts	7.50
Foundry, by-product, delivered in Chicago switching district	7.75
Foundry, by-product, New England, delivered	10.00
Foundry, by-product, Newark or Jersey City, del'd	8.20 to 8.81
Foundry, by-product, Phila.	8.50
Foundry, by-product, Cleveland, delivered	7.82
Foundry, Birmingham	5.00
Foundry, by-product, St. Louis, f.o.b. ovens	8.00
Foundry, by-product, del'd St. Louis	9.00

Coal	
	Per Net Ton
Mine run size coal, f.o.b. W. Pa. mines	\$1.10 to \$1.20
Mine run coking coal f.o.b. W. Pa. mines	1.20 to 1.40
Gas coal, 1/4-in., f.o.b. Pa. mines	1.30 to 1.40
Mine run gas coal, f.o.b. Pa. mines	1.30 to 1.40
Steam slack, f.o.b. W. Pa. mines	0.45 to 0.55
Gas slack, f.o.b. W. Pa. mines	0.65 to 0.75

Fuel Oil	
	Per Gal. f.o.b. Bayonne, N. J.
No. 3 distillate	4.00c.
No. 4 industrial	3.50c.
Per Gal. f.o.b. Baltimore	
No. 3 distillate	4.00c.
No. 4 industrial	3.50c.
Per Gal. del'd Chicago	
No. 3 industrial fuel oil	3.25c.
No. 5 industrial fuel oil	2.65c. to 2.75c.
Per Gal. f.o.b. Cleveland	
No. 3 distillate	5.00c.
No. 4 industrial	4.50c.

REFRACTORIES

Fire Clay Brick	
	Per 1000 f.o.b. Works
High-heat Intermediate Duty Brick	Duty Brick
Pennsylvania	\$40.00
Maryland	40.00
New Jersey	40.00
Ohio	40.00
Kentucky	40.00
Missouri	40.00
Illinois	40.00
Ground fire clay, per ton	7.00

Chrome Brick	
	Per Net Ton
Standard size	\$42.50 to \$45.00

Silica Brick	
	Per 1000 f.o.b. Works
Pennsylvania	\$40.00
Chicago	40.00
Birmingham	50.00
Silica clay, per ton	8.00

Magnesite Brick	
	Per Net Ton
Standard sizes, burned, f.o.b. Baltimore and Chester, Pa.	\$85.00
Unburned, f.o.b. Baltimore	52.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00
Domestic, f.o.b. Chewelah, Wash.	22.00

CAST IRON PIPE

	Per Net Ton
6-in. and larger, del'd Chicago	\$13.40 to \$14.40
4-in., del'd Chicago	46.40 to 47.40
6-in. and larger, del'd New York	38.30
4-in., del'd New York	41.30
6-in. and larger, Birmingham	\$35.00 to \$6.00
4-in., Birmingham	38.00 to 39.00

Class "A" and gas pipe, \$5 extra.

VALLEY

Per Gross ton f.o.b. Valley furnace:	
Basic	\$15.00
Bessemer	16.00
Gray forge	15.50
No. 2 foundry	15.50
No. 3 foundry	15.00
Malleable	15.50
Low phos., copper free	24.00

Freight rate to Pittsburgh or Cleveland district, \$1.89.

PITTSBURGH

Per gross ton, f.o.b. Pittsburgh district furnace:	
Basic	\$15.50
No. 2 foundry	16.00
No. 3 foundry	15.50
Malleable	16.00
Bessemer	16.50

Freight rates to points in Pittsburgh district range from 69c. to \$1.26.

CHICAGO

Per gross ton at Chicago furnaces:	
N't'n No. 2 fdy.	\$16.00
N't'n No. 1 fdy.	16.50
Malleable, not over 2.25 sil.	16.00
High phosphorus	16.00
Lake Super. charcoal, sil. 1.50, by rail	23.17
Southern No. 2 fdy.	\$16.14 to 17.14
Low phos., sil. 1 to 2, Copper free	25.00
Silvery, sil. 8 per cent.	24.92
Bess. ferro-sil'n, 15 per cent.	28.92

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnaces, not including a switching charge.

ST. LOUIS

Per gross ton at St. Louis:	
No. 2 fdy., sil. 1.75 to 2.25, f.o.b. Granite City, Ill.	\$16.00
Del'd St. Louis	16.85
Malleable, f.o.b. Granite City	16.50
Northern No. 2 fdy., del'd St. Louis	18.30
Northern malleable, del'd	18.30
Northern basic, del'd	18.30
Southern fdy., sil. 1.75 to 2.25 del'd St. Louis	16.35

Freight rates, 83c. (average) Granite City to St. Louis; \$2.30 from Chicago; \$4.56 from Birmingham.

NEW YORK

Per Gross ton, delivered New York district:	
*Buffalo, No. 2, del'd Eastern	\$17.41
N. J.	
Buffalo malleable, del'd Eastern	17.91
East Pa. No. 2 fdy.	17.02
East Pa. No. 2X fdy.	17.52

Freight rates: \$1.52 to \$2.63 from eastern Pennsylvania.
*Prices delivered to New Jersey cities having rate of \$3.41 a ton from Buffalo.

BUFFALO

Per gross ton, f.o.b. furnace:	
No. 2 fdy.	\$16.00
No. 2X fdy.	16.50
No. 1 fdy.	17.50
Malleable, sil. up to 2.25	16.50
Basic	14.00
Lake Superior charcoal, del'd	23.41

CINCINNATI

Per gross ton, delivered Cincinnati:	
Ala. fdy., sil. 1.75 to 2.25	\$16.51
Ala. fdy., sil. 2.25 to 2.75	16.76
Tenn. fdy., sil. 1.75 to 2.25	16.51
N't'n No. 2 foundry	\$17.01 to 18.19
S't'n Ohio silvery, 8%	21.39

Freight rates, \$1.89 from Ironton and Jackson, Ohio; \$3.82 from Birmingham.

CLEVELAND

Per gross ton at Cleveland furnace:	
N't'n No. 2 fdy.	\$15.50
Malleable	15.50
Ohio silvery, 8 per cent.	23.00
Stand. low phos., Valley	23.00
Southern No. 2 fdy.	16.14

Prices are f.o.b. furnace except on Southern foundry and silvery iron. Freight rates; 63c. average local switching charge; \$3.00 from Jackson, Ohio; \$6.14 from Birmingham.

PHILADELPHIA

Per gross ton at Philadelphia:	
East. Pa. No. 2	\$16.34
East. Pa. No. 2X	16.84
East. Pa. No. 1X	17.34
Basic (del'd east Pa.)	16.09
Malleable (del'd east Pa.)	16.84
Stand. low phos. (f.o.b. east Pa. furnace)	\$22.00 to \$23.00
Cop. b'r'g low phos.	22.00 to 23.00
Va. No. 2	21.79
Va. No. 2X	22.29

Prices, except as specified otherwise, are del'd Philadelphia. Freight rates: 84c. to \$1.79 from eastern Pennsylvania furnaces; \$4.67 from Virginia furnaces.

Pig Iron, Ores, Ferroalloys

BIRMINGHAM

Per gross ton, f.o.b. Birmingham dist. furnace:	
No. 2 fdy., 1.75 to 2.25 sil.	\$12.00
No. 2 soft, 2.25 to 2.75 sil.	12.50
Basic	12.00

NEW ENGLAND

Per gross ton delivered Boston and nearby New England points:	
Buffalo, sil. 1.75 to 2.25	\$18.53 to \$19.04
Buffalo, sil. 2.25 to 2.75	18.53 to 19.04
Ala., sil. 1.75 to 2.25	18.00 to 18.50

CANADA

Per gross ton:	
Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75	\$22.60
No. 2 fdy., sil. 1.75 to 2.75	22.10
Malleable	22.60
Delivered Montreal	
No. 1 fdy., sil. 2.25 to 2.75	\$24.00
No. 2 fdy., sil. 1.75 to 2.25	23.50
Malleable	24.00
Basic	\$23.00 to 23.50

Ferromanganese

Per Gross Ton	
Domestic, 80% sea-board	\$68.00 to \$72.00
Foreign, 80% Atlantic or Gulf port, duty paid	68.00

The lower price applies to contracts for delivery to June 30, for spot shipment the price is \$72.

Spiegeleisen

Per Gross Ton Furnace	
Domestic, 19 to 21%	\$24.00

Electric Ferrosilicon

Per Gross Ton Delivered	
50% (carloads)	\$74.50
50% (less carloads)	82.00
75% (carloads)	120.00
75% (less carloads)	130.00
14% to 16% (f.o.b.) Welland, Ont. (in carloads)	31.00
14% to 16% (less carloads)	36.00

Silvery Iron

F.o.b. Jackson County, Ohio, or Pittsburgh Furnace	
Per Gross Ton	Per Gross Ton
6%	\$19.00
7%	19.50
8%	20.00
9%	20.50
10%	21.00
11%	21.50
12%	22.00
13%	22.50
14%	23.00
15%	23.50
16%	24.00

Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio, or Pittsburgh Furnace	
Per Gross Ton	Per Gross Ton
10%	\$21.50
11%	22.00
12%	22.50
13%	23.00
14%	23.50
15%	24.00
16%	24.50

Manganese 1 1/2 to 3%, \$1 a ton additional. For each unit of manganese over 3%, \$1 a ton additional. Phosphorus 0.05% or over, \$1 a ton additional.

Other Ferroalloys

Ferrotungsten, per lb. wo. del., carloads	94c.
Ferrotungsten, less carloads	\$1.00
Ferrocobalt, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads	9.50c.

PITTSBURGH

Per gross ton delivered consumers' yards:	
No. 1 heavy melting steel	\$11.50 to \$12.00
No. 2 heavy melting steel	10.25 to 10.75
No. 2 railroad wrought	11.50 to 12.00
Scrap rails	11.50 to 12.00
Rails 3 ft. and under	12.50 to 13.00
Sheet bar crops, ordinary	12.00 to 12.50
Compressed sheet steel	11.50 to 12.00
Hand bundled sheet steel	10.00 to 10.50
Hvy. steel axle turnings	8.50 to 10.00
Machine shop turnings	8.25 to 8.75
Short shov. steel turnings	8.25 to 8.75
Short mixed borings and turnings	7.75 to 8.25
Cast iron borings	11.75 to 12.25
Cast iron car wheels	11.50 to 12.00
Heavy breakable cast	9.00 to 9.50
No. 1 cast	10.00 to 11.00
Railr. knuckles and couplers	13.00 to 14.00
Rail, coil and leaf springs	13.00 to 14.00
Rolled steel wheels	13.00 to 14.00
Low phos. billet crops	14.00 to 14.50
Low phos. sheet bar crops	13.50 to 14.00
Low phos. plate scrap	13.50 to 14.00
Low phos. punchings	13.50 to 14.00
Steel car axles	13.00 to 15.50

CHICAGO

Delivered Chicago district consumers:	
Per Gross Ton	
Heavy melting steel	\$8.75 to \$9.00
Shoveling steel	8.50 to 9.00

Ferrocobalt, 2% car-	16.50c. to 17.00c.
Ferrocobalt, 1% car-	17.50c. to 18.00c.
Ferrocobalt, 0.10%	19.50c. to 20.00c.
Ferrocobalt, 0.06%	20.00c. to 20.50c.
Ferrocobalt, del. per lb. contained Va.	\$2.60 to 2.80
Ferrocobalt, 15 to 18%, per net ton, f.o.b. furnace in carloads	14.00
Ferrophosphorus, electric, or blast furnace material, in carloads	18%
Rockdale, Tenn., base, per gross ton with \$2 unitage	50.00
Ferrophosphorus, electric, 24% f.o.b. Anniston, Ala., per gross ton with \$2.75 unitage	85.00
Ferromolybdenum, per lb. Mo., del.	60c.
Calcium molybdate, per lb. Mo., del.	80c.
Silico spiegel, per ton, f.o.b. furnace, car lots or less, per ton	\$36.00 to 41.00
Silico-manganese, gross ton, delivered:	
2.50% carbon grade	85.00
2% carbon grade	90.00
1% carbon grade	100.00
Spot prices	\$5 a ton higher

Ores

Lake Superior Ores, Delivered Lower Lake Ports	
	Per Gross Ton
Old range Bessemer, 51.5% iron	\$48.00
Old range, non-Bessemer, 51.50% iron	48.00
Mesabi Bessemer, 51.50% iron	48.00
Mesabi non-Bessemer, 51.50% iron	48.00
High phosphorus, 51.50% iron	48.00

Foreign Ore, c.i.f. Philadelphia or Baltimore	
	Per Unit
Iron, low phos., copper free, 55 to 58% iron, dry Spanish or Algerian	7.50c.
Iron, low phos., Swedish, average 68 1/4% iron	8c.
Iron, basic or foundry, Swedish, average, 65% iron	7.50c.
Iron, basic or foundry, Russian, aver. 63% iron (nom.)	7.50c.
Manganese, Caucasian, washed 52% Mn	1.00
Manganese, African, Indian, 50-52%	1.00
Manganese, Brazilian, 48 to 49%	1.00

Per Net Ton	
Tungsten, Chinese wolframite, duty paid	\$10.00
Tungsten, domestic scheelite	\$8.00 to \$10.00
Chrome, 45%, Cr2O3, crude, c.i.f. Atlantic seaboard	16.00
Chrome, 48%, Cr2O3, c.i.f. Atlantic seaboard	18.00

*Quotations nominal in absence of sale.

Fluorspar

Per Net Ton	
Domestic, washed gravel, 85-5 f.o.b. Kentucky and Illinois mines	\$10.50 to \$11.50
No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines	13.50
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic port, duty paid	16.75
Domestic, No. 1 ground bulk, 85 to 98% calcium fluoride, not over 2% silicon, f.o.b. Illinois and Kentucky mines	30.00

Iron and Steel Scrap

Hydraulic comp. sheets	\$7.00 to \$7.50
Drop forge flashings	6.25 to 6.75
No. 1 busheling	7.00 to 7.50
Rolled car wheels	9.50 to 10.00
Railroad tires	9.50 to 10.00
Railroad leaf springs	9.50 to 10.00
Axle turnings	7.00 to 7.50
Steel couplers and knuckles	9.50 to 10.00
Coil springs	10.50 to 11.00
Axle turnings (elec. fur.)	8.00 to 8.50
Low phos. punchings	9.50 to 10.00
Low phos. plates, 12 in. and under	9.50 to 10.00
Cast iron borings	5.50 to 6.00
Short shoveling turnings	5.50 to 6.00
Machine shop turnings	5.50 to 6.00
Revolving rails	9.50

No. 2 busheling	\$4.00 to \$4.50
Locomotive tires, smooth	7.50 to 8.50
Pipe and flange	1.25 to 1.75
No. 1 machinery cast	8.75 to 9.25
Cast automobile cast	8.75 to 9.25
No. 1 railroad cast	8.50 to 9.00
No. 1 agricultural cast	8.00 to 8.50
Store plate	7.00 to 7.50
Grate bars	7.00 to 7.25
Flange sheet	8.00 to 8.50

*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

PHILADELPHIA

Per gross ton delivered consumers' yards:	
No. 1 heavy melting steel	\$9.00 to \$9.50
No. 2 heavy melting steel	8.50 to 9.00
No. 1 railroad wrought	11.00 to 11.50
Bundled sheets	4.00 to 4.50
Hydraulic compressed, new	6.00 to 6.50
Hydraulic compressed, old	5.00 to 5.50
Machine shop turnings	5.75 to 6.00
Heavy axle turnings	7.50 to 8.00
Cast borings	5.00 to 5.50
Heavy breakable cast	9.50 to 10.00
Store plate (steel works)	7.00 to 7.50
No. 1 low phosph	11.00 to 11.50
Couplers and knuckles	10.00 to 10.50
Roller wheels	10.00 to 10.50
No. 1 blast furnace	5.00 to 5.50
Spec. iron and steel pipe	8.00 to 8.50
Shafting	13.00 to 13.50
Steel axles	13.00 to 13.50
No. 1 forge fire	8.00 to 8.50
Cast iron car wheels	10.00 to 10.50
No. 1 cast	10.00 to 10.50
Cast borings (chem.)	10.00 to 10.50
Steel rails for rolling	9.50 to 10.00

CLEVELAND

Per gross ton delivered consumers' yards:	
No. 1 heavy melting steel	\$9.25 to \$9.50
No. 2 heavy melting steel	8.75 to 9.00
Compressed sheet steel	9.00 to 9.50
Light bundled sheet stampings	6.50 to 7.00
Drop force flashings	8.00 to 8.50
Machine shop turnings	6.50 to 7.00
Short shoveling turnings	7.00 to 7.50
No. 1 busheling	7.50 to 8.00
Steel axle turnings	7.50 to 8.00
Low phosph. billet crops	12.00 to 12.50
Cast iron borings	6.75 to 7.00
Mixed borings and short turnings	6.75 to 7.00
No. 2 busheling	6.50 to 7.00
No. 1 cast	10.00 to 10.50
Railroad grate bars	6.00 to 6.50
Store plate	5.50 to 6.00
Rails under 3 ft.	8.50 to 9.00
Rails for rolling	10.00 to 10.50
Railroad malleable	10.00 to 10.50
Cast iron car wheels	11.00 to 11.50

BUFFALO

Per gross ton, f.o.b. Buffalo consumers' yards:	
No. 1 heavy melting steel	\$9.50 to \$10.00
No. 2 heavy melting steel	8.50 to 9.00
Scrap steel	8.00 to 8.50
Scrap hydraulic comp. sheets	8.50 to 9.00
Old hydraulic comp. sheets	7.50 to 8.00
Drop force flashings	8.00 to 8.50
No. 1 busheling	8.50 to 9.00
Hyv. steel axle turnings	6.50 to 7.00
Machine shop turnings	5.50 to 6.00
Knuckles and couplers	10.00 to 10.50
Roller wheels	10.00 to 10.50
Roller steel wheels	10.00 to 10.50
Low phosph. billet crops	12.00 to 12.50
Short shov. steel turnings	6.50 to 7.00
Short mixed borings and turnings	6.00 to 6.50
Cast iron borings	6.00 to 6.50
Steel car axles	5.00 to 5.50
Iron axles	11.00 to 12.00
No. 1 machinery cast	10.50 to 11.00
No. 1 cupola cast	9.50 to 10.00
Store plate	8.00 to 8.50
Steel rails, 8 ft. and under	11.50 to 12.00
Cast iron car wheels	10.00 to 10.50
Industrial malleable	9.50 to 10.00
Railroad malleable	11.00 to 11.50
Chemical borings	7.50 to 8.00

BIRMINGHAM

Per gross ton delivered consumers' yards:	
Heavy melting steel	\$9.00 to \$9.50
Scrap steel rails	8.50 to 9.00
Short shoveling turnings	6.50 to 7.00
Store plate	6.50 to 7.00
Steel axles	10.00 to 11.00
Iron axles	10.50 to 11.00
No. 1 railroad wrought	5.00 to 5.50
Rails for rolling	9.00 to 9.50
No. 1 cast	9.00 to 9.50
Tramcar wheels	9.00 to 9.50
Cast iron borings, chem.	9.00 to 9.50

ST. LOUIS

Per gross ton delivered consumers' yards:	
Selected heavy steel	\$8.00 to \$8.50
No. 1 heavy melting	8.00 to 8.50
No. 2 heavy melting	7.50 to 8.00
No. 1 locomotive tires	6.00 to 6.50
Misc. stand-sec. rails	8.00 to 8.50
Railroad springs	9.50 to 10.00
Bundled sheets	4.50 to 5.00
No. 2 railroad wrought	8.00 to 8.50
No. 1 busheling	3.50 to 4.00
Cast iron borings and shoveling turnings	3.00 to 3.50
Rails for rolling	9.50 to 10.00
Machine shop turnings	3.00 to 3.50
Heavy turnings	4.00 to 4.50
Steel car axles	9.50 to 10.00
Wrot. iron bars and trans.	8.00 to 8.50
No. 1 railroad wrought	8.50 to 9.00
Steel rails less than 3 ft.	10.00 to 10.50
Cast iron car wheels	9.00 to 9.50
No. 1 machinery cast	8.00 to 8.50
Railroad malleable	8.00 to 8.50
No. 1 railroad cast	8.50 to 9.00
Store plate	7.00 to 7.50
Relay rails, 60 lb. and under	18.00 to 18.50

Relay rails, 60 lb. and over	\$20.00 to \$21.00
Agricult. malleable	4.00 to 4.50

BOSTON

Dealers' buying prices per gross ton:	
No. 1 heavy melting steel	\$5.50 to \$5.75
Scrap T rails	4.75 to 5.00
Machine shop turnings	2.00 to 2.25
Cast iron borings	2.00 to 2.25
Bundled skeleton, long	3.00 to 3.25
Forge flashings	3.00 to 3.25
Blast furnace scrap	1.75 to 2.00
Shafting	7.50 to 8.00
Steel car axles	8.00 to 8.50
Wrought pipe	2.25 to 2.50
Rails for rolling	6.00 to 6.50
Cast iron borings, chemical	7.25 to 7.75

Per gross ton delivered consumers' yards:	
Textile cast	\$7.00 to \$7.50
No. 1 machinery cast	7.00 to 7.50
Store plate	4.25 to 4.50
Railroad malleable	3.50 to 3.50

NEW YORK

Dealers' buying prices per gross ton:	
No. 1 heavy melting steel	\$5.50 to \$6.00
No. 2 heavy melting steel	4.50 to 5.00
Heavy melting steel (yard)	2.50 to 3.00
Heavy breakable cast	5.00 to 5.50
Store plate (steel works)	3.50 to 4.00
Machine shop turnings	2.50 to 3.00
Short shoveling turnings	2.50 to 3.00
Cast borings	2.50 to 3.00
No. 1 blast furnace	2.50 to 3.00
Steel car axles	9.50 to 10.00

PITTSBURGH

Base per lb.	
Plates	2.85c
Structural shapes	2.85c
Soft steel bars and small shapes	2.60c
Reinforcing steel bars	2.60c
Cold-finished and screw stock	2.60c
Rounds and hexagons	2.95c
Squares and flats	2.95c
Hoops and bands, under 4 in.	2.95c
Hot-rolled annealed sheets (No. 24)	3.10c
25 or more bundles	3.10c
Galv. sheets (No. 24), 25 or more bundles	3.60c
Hot-rolled sheets (No. 10)	2.90c
Galv. corrug. sheets (No. 24)	2.90c
Square (less than 3750 lb.)	\$3.61
Spikes, large	2.40c
Small	2.65c
Boat	2.90c
Track bolts, all sizes, per 100 count	70 per cent off list
Machine bolts, 100 count	70 per cent off list
Carriage bolts, 100 count	70 per cent off list
Nuts, all styles, 100 count	70 per cent off list
Large rivets, base per 100 lb.	\$3.00
Wire, black, soft ann't'd, base per 100 lb.	2.85
Wire, galv. soft, base per 100 lb.	3.10
Common wire nails, per keg	2.20
Cement cut nails, per keg	2.20
On plates, structural, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applied to orders of 400 to 999 lb.	

CHICAGO

Base per lb.	
Plates and structural shapes	3.00c
Soft steel bars	2.75c
Reinforc. bars, billet steel	1.50c to 1.90c
Hall steel reinforcement	1.50c to 1.65c
Cold-finish steel bars and shafting	3.00c
Rounds and hexagons	3.00c
Flats and squares	3.50c
Bands, 3/16 in. (in Nos. 10 and 12 gages)	2.95c
Hoops (No. 14 gage and lighter)	3.50c
Hot-rolled annealed sheets (No. 24)	3.45c
Galv. sheets (No. 24)	3.85c
Hot-rolled sheets (No. 10)	2.75c
Spikes (3/16 in. and lighter)	3.45c
Track bolts	4.90c
Rivets, structural (keg lots)	2.75c
Rivets, boiler (keg lots)	2.75c
Per Cent Off List	
Machine bolts	65
Carriage bolts	65
Coach and lag screws	65
Hot-pressed nuts, sq., hex. tap. or blank	65
Hex. head cap screws	80 and 10
Cup point set screws	75
Flat head bright wood screws	50 and 10
Spring cotters	60 and 10
Store bolts	30
Rd. hd. tank rivets, 7/16 in. and smaller	65
Wrought washers	\$1.50 off list
No. 8 black ann't'd wire, per 100 lb.	\$3.45
Com. wire nails, base per keg	2.30
Cement cut nails, base per keg	2.30

NEW YORK

Base per lb.	
Plates and struc. shapes	3.10c
Soft steel bars, small shapes	3.10c
Iron bars, swed. charcoal	5.75c to 6.25c
Cold-finish steel bars and shafting	3.54c
Flats and squares	4.04c
Cold-rolled strip, soft and quarter hard	4.95c
Hoops	3.95c
Hot-rolled sheets (No. 10)	2.60c
Hot-rolled ann't'd sheets (No. 24*)	3.25c
Galvanized sheets (No. 24*)	3.50c
Long term sheets (No. 24)	4.50c
Standard tool steel	12.00c
Wire, black annealed (No. 10)	3.00c
Wire, galv. annealed (No. 10)	4.05c
Tire steel 1/4 x 1/4 in. and larger	3.40c
Smooth finish, 1 to 2 1/4 x 1/4 in. and larger	3.75c

Spec. iron and steel pipe	\$3.50
Forge fire	4.25
No. 1 railroad wrought	\$5.00 to 5.50
No. 1 yard wrought long	3.50 to 3.75
Rails for rolling	5.50 to 6.00
No. 2 cast	5.50 to 5.75
Stove plate (foundry)	5.00 to 5.50
Cast borings (chemical)	6.00 to 6.50
Per gross ton, delivered local foundries:	
No. 1 machinery cast	\$9.00
No. 1 hv. cast (cupola size)	7.50 to 8.00
No. 2 cast	5.00 to 5.50

CINCINNATI

Dealers' buying prices per gross ton:	
Heavy melting steel	\$7.25 to \$7.75
Loose sheet clippings	2.50 to 3.00
Bundled sheets	4.50 to 5.00
Cast iron borings	3.75 to 4.25
Machine shop turnings	3.25 to 3.75
No. 1 busheling	4.75 to 5.25
Rails for rolling	8.00 to 8.50
No. 1 locomotive tires	7.25 to 7.75
Short rails	10.50 to 11.00
Cast iron car wheels	7.25 to 7.75
No. 1 machinery cast	7.25 to 7.75
No. 1 railroad cast	7.25 to 7.75
Burnt cast	5.00 to 5.50
Store plate	5.00 to 5.50
Agricultural malleable	7.75 to 8.25
Railroad malleable	8.00 to 8.50

Open hearth spring steel, bases	4.50c to 7.00c
Common wire nails, base, per keg	\$2.65
Machine bolt, cut thread:	Off List
1/4 x 6 in. and smaller, 65 to 85 and 10	
1/2 x 6 in. and smaller, 65 to 85 and 10	
3/4 x 6 in. and smaller, 65 to 85 and 10	
1 x 6 in. and smaller, 65 to 85 and 10	
Boiler tubes:	Per 100 Ft.
Lap welded, 2-in.	\$18.05
Seamless welded, 2-in.	19.24
Charcoal iron, 2-in.	24.94
Charcoal iron, 4-in.	63.65
*No. 28 and lighter, 36 in. wide, 20c higher per 100 lb.	

ST. LOUIS

Base per lb.	
Plates and struc. shapes	3.25c
Bars, soft steel or iron	3.00c
Cold-fin. rounds, shafting, screw stock	3.36c
Hot-rolled annealed sheets (No. 24)	3.00c
Galv. sheets (No. 24)	3.00c
Hot-rolled sheets (No. 10)	3.00c
Black corrug. sheets (No. 24)	3.65c
Galv. corrug. sheets	4.05c
Structural rivets	3.00c
Boiler rivets	3.00c
Tank rivets, 7/16 in. and smaller:	
100 lb. or more	70
Less than 100 lb.	70
Machine bolts	65
Carriage bolts	65
Lag screws	65
Hot-pressed nuts, sq., blank or tapped, 200 lb. or more	65
Hot-pressed nuts, hex., blank or tapped, 200 lb. or more	65
Less than 200 lb.	65

PHILADELPHIA

Base per lb.	
*Plates, 1/4-in. and heavier	2.45c
*Structural shapes	2.45c
*Soft steel bars, small shapes, iron bars (except bands)	2.45c
Reinforc. steel bars, sq., twisted and deformed	2.30c
Cold-finished steel bars	3.35c
*Steel hoops	3.00c
*Steel bands, No. 12 to 3/16 in. incl.	2.75c
Spring steel	5.00c
*Hot-rolled annealed sheets (No. 24)	3.15c
*Galvanized sheets (No. 24)	3.50c
*Hot-rolled annealed sheets (No. 10)	2.70c
Black ann't'd wire, per 100 lb.	\$2.55
No. 8 galv. wire, per 100 lb.	2.00
Com. wire nails, base per keg	2.10
Swedish iron bars	5.60c

These prices are subject to quantity differentials except on reinforcing and Swedish iron bars.
*Base prices subject to deductions on orders aggregating 4000 lb. or over.
†For 50 bundles or over.

CLEVELAND

Base per lb.	
Plates and struc. shapes	2.95c
Soft steel bars	2.75c
Reinforc. steel bars	1.75c to 2.35c
Cold-fin. steel bars	2.95c
Cold-finished strip	5.55c
Hot-rolled annealed sheets (No. 24)	3.25c
Galvanized sheets (No. 24)	3.50c
Hot-rolled sheets (No. 10)	3.00c
Black ann't'd wire, per 100 lb.	\$2.55
No. 8 galv. wire, per 100 lb.	2.00
Com. wire nails, base per keg	2.10

*Net base, including boring and cutting to length.

CINCINNATI

Base per lb.	
Plates and struc. shapes	3.25c
Bars, soft steel or iron	3.00c
New billet reinforcing bars	3.00c
Rail steel reinforcing bars	3.00c
Hoops	3.90c
Cold-fin. rounds and hex.	3.35c

DETROIT

Dealers' buying prices per gross ton:	
Hvy. melting steel	\$7.50 to \$8.00
Borings and short turnings	5.50 to 6.00
Long turnings	4.50 to 5.00
No. 1 machinery cast	8.00 to 8.50
Automotive cast	10.00 to 10.50
Hydraulic comp. sheets	7.50 to 8.00
Store plate	4.50 to 5.00
New No. 1 busheling	6.50 to 7.00
Old No. 2 busheling	4.50 to 5.00
Sheet clippings	1.50 to 2.00
Flashings	5.50 to 6.00

CANADA

Dealers' buying prices per gross ton:	
Heavy melting steel	\$4.50 to \$4.50
Rails, scrap	4.50 to 4.50
Machine shop turnings	2.00 to 2.00
Boiler plate	4.50 to 4.50
Heavy axle turnings	2.50 to 2.50
Cast borings	2.00 to 2.00
Steel borings	2.00 to 2.00
Wrought pipe	2.50 to 2.50
Steel axles	4.50 to 6.00
Axles, wrought iron	4.50 to 6.50
No. 1 machinery cast	7.75 to 9.00
Store plate	4.50 to 5.00
Standard car wheels	7.25 to 7.00
Malleable	6.75 to 7.00

BUFFALO

Base per lb.	
Plates and struc. shapes	3.25c
Soft steel bars	2.95c
Reinforcing bars	2.95c
Cold-fin. flats and sq.	3.00c
Rounds and hex.	3.00c
Cold-rolled strip steel	5.25c
Hot-rolled annealed sheets (No. 24)	3.35c
Galv. sheets (No. 24)	3.75c
Bands	3.30c
Hoops	3.55c
Hot-rolled sheets (No. 10) 48-in. and narrower	3.00c
Wider than 48-in.	3.25c
Com. wire nails, base per keg	\$2.49
Black wire, base per 100 lb.	3.25

BOSTON

	Per Lb.
*Beams, channels, angles, tees, zees	2.80c.
*H beams and shapes	2.60c.
*Plates—sheared, tank and	
in. thick, incl.	2.60c.
*Cold-rolled plates, diamond pattern	4.50c.
*Bar and bar shapes (mild steel)	2.50c.
*Bands 3/16 in. thick and	
No. 12 ga. incl.	3.50c.
*Hoops, No. 14 and	
lighter	4.90c. to
*H-beams, half ovals, ovals and	5.40c.
bevels	3.75c.
Tire steel, rd. ed. 1 1/2 x 1/4 in.	4.50c.
and larger	4.75c.
Smaller sizes	3.80c.
Cold-rolled rods	5.20c.
Cold-rolled strip steel	4.10c.
Cold-finished squares and flats	2.45c.
*Blue annealed sheets, No. 10 ga.	
One pass cold-rolled sheets No. 24	
ga.	3.90c.
Rined steel sheets No. 24 ga.	4.00c.
Galvanized steel sheets No. 24 ga.	5.00c.
Lead coated (long terms) No. 24 ga.	
Black wire, base per 100 lb. 2508	
lb. or less	3.25c.
Over 2500 lb.	3.25c.

PLANT EXPANSION AND EQUIPMENT BUYING

◀ NEW ENGLAND ▶

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until June 27 for steel forgings (Schedule 176), radial ball bearings (Schedule 249) for Newport, R. I., Navy Yard.

Eldridge Brewing Co., South Street, Portsmouth, N. H., let general contract to W. J. Sinnott, 333 Washington Street, Boston, for extensions and improvements, including one-story mechanical bottling works. Cost over \$60,000 with equipment. Funk & Wilcox, 26 Pemberton Square, Boston, are architects.

Porter Forge & Furnace Co., Everett, Mass., has been organized by Henry W. Porter and H. R. Geddes, 6 Ashland Street, to manufacture mechanical equipment.

Whele Brewing Co., Campbell Avenue, West Haven, Conn., let general contract to National Construction Co., 1145 Chapel Street, New Haven, for two-story and basement addition, 50 x 90 ft., for storage and distribution. Cost about \$55,000 with equipment.

Eric E. Esseen, Inc., Worcester, Mass., has been organized by Eric E. Esseen and Richard N. Fairfield, 38 Huntington Avenue, to manufacture valve spring testers and kindred mechanical equipment.

Bay State Artesian Well Co., 23 School Street, Concord, N. H., has asked bids on general contract for one-story and basement storage and distributing plant, 61 x 100 ft. Cost about \$25,000 with equipment. E. B. Whipple, 87 Weybosset Street, Providence, R. I., is architect.

◀ NORTH ATLANTIC ▶

Pan-American Petroleum & Transport Co., 122 East Forty-second Street, New York, subsidiary of Standard Oil Co. of Indiana, has selected site of about 250 acres at Texas City, Tex., for new oil refinery. Plant will include steel tank farm for storage and distribution, power house, pumping station and other structures. Considerable part of refinery will be used for gasoline production. Company recently proposed to build this plant on Houston ship channel, Houston, Tex., but has abandoned such location. Cost about \$7,500,000 with equipment.

James Everard Brewery, East 134th Street, New York, idle for some time, has been acquired by new interests headed by Morris Unger, 2332 Tilbury Avenue, Pittsburgh. Plans are under way for extensions and improvements, with installation of brewing, bottling and other machinery, boiler plant equipment, etc. Cost over \$85,000 with machinery.

Greenwich Spring & Body Mfg. Co., New York, has been organized by James Duffy, 153 Otis Avenue, Grant Manor, N. Y., and Carmine Corvo, 1924 Twenty-third Drive, Astoria, L. I., to manufacture automobile springs, commercial bodies, etc. Company will take over Greenwich Spring Mfg. Co., 495 Greenwich Street.

Signal Supply Officer, Army Base, Brooklyn, asks bids until June 26 for dynamotor units and battery boxes, radio transmitters, radio control boxes, radio receivers, etc. (Circular 127).

Metropolitan Cement Corp., 261 Fifth Avenue, New York, affiliated with Edison Cement Co., same address, has asked bids on general contract for two story addition at new mill in Raritan Township, N. J., including remodeling and improving existing buildings, acquired several months ago. Company has 47-acre tract at new location and will use part of plant for manufacture of cement conduits and kindred products. Cost about \$300,000 with equipment. W. D. Cloos is vice-president and general manager.

Dayton Pressed Steel Corp., Bronx, New York, has been organized by John E. Wahlin, 7134 Sixty-ninth Street, Glendale, L. I., and George C. Gherke, 180-A Lexington Avenue, Jersey City, N. J., to manufacture steel and metal specialties.

Interstate Bar Mfg. Co., Long Island City, recently organized to manufacture beer service equipment, has leased factory at 4913-15 Twenty-second Street, for establishment of plant.

Calco Chemical Co., Inc., Bound Brook Road, Bound Brook, N. J., manufacturer of industrial chemicals, etc., has begun erection of three-story and basement addition by day labor. Cost over \$75,000 with equipment.

National Freezers, Inc., New York, has been organized, capital \$154,500, by Edmund E. Pattison, 925 Montrose Avenue, Chicago, and associates, to manufacture freezing and refrigerating equipment. Abner Schoen, 512 Fifth Avenue, New York, is representative.

Johnson & Johnson, New Brunswick, N. J., manufacturer of surgical supplies, soaps, etc., has leased factory on 4-acre tract in Clearing Industrial District, Chicago, for branch plant. Structure will be improved and equipment to cost over \$350,000 installed. Unit is scheduled to be ready for operation in September.

Midget Thermostat, Inc., Newark, N. J., has been organized by Benjamin F. Coffin, 6 Dawson Street, and associates, to manufacture thermostats and parts and other heating-control equipment.

Newark Steel Heat-Treating Co., Newark, recently organized, has begun operations in plant at 283-89 Thomas Street, and will advance production for annealing, case-hardening, carburizing and kindred work. F. E. Smith, formerly connected with Crucible Steel Co., Harrison, N. J., is president.

Schiavone & Bonomo Brothers, Inc., 8 Noble Street, Newark, manufacturer of iron and other metal products, has plans for one-story addition, including improvements in present works. Cost about \$25,000 with equipment. D'Elia, Mastrandelo & Pangaro, 905 Bergen Avenue, Jersey City, N. J., are architects.

Department of Public Affairs, City Hall, Newark, Meyer C. Ellenstein, mayor, director, is arranging financing in amount of \$3,500,000 for construction and completion of municipal railway project, including purchase of equipment, etc.

A. C. Gruenewald, 911 Dorset Street, Philadelphia, has leased three-story building, 122 x 133 ft., at North American and Philip Street, and will remodel for new brewery. Bottling, refrigerating, conveying and other equipment will be installed.

Flock Brewing Co., Williamsport, Pa., H. F. William Flock, president, is planning expansion and modernization, including new equipment. Financing in amount of \$190,000 has been arranged, portion of fund to be used for work.

Board of Education, Wilmington, Del., plans installation of manual training department in new multi-story high school on 23-acre tract recently acquired. Cost \$1,500,000. E. William Martin, duPont Building, is architect.

Laron, Inc., Syracuse, N. Y., has been organized by Richard Aronson, 431 East Fayette Street, and Herman R. Lipstein, 610 University Avenue, to manufacture metal products.

L. C. Smith & Corona Typewriters, Inc., 701 East Washington Street, Syracuse, N. Y., is advancing production schedule and has increased working force to more than 1000 operatives.

◀ SOUTH ATLANTIC ▶

Emil Dahms, Fourth and Hudson Streets, Baltimore, manufacturer of wire-bound kegs, barrels, etc., has acquired factory at Fairmount Avenue and Haven Street for new plant.

Bureau of Yards and Docks, Navy Department, Washington, will secure appropriation of \$8,008,500 for additions to naval air station at Pensacola, Fla. Of amount noted, over \$6,000,000 will be used for new buildings, shops and equipment.

Forest Service, Department of Agriculture, Washington, asks bids (no closing date stated) for tractors, road contractors' machines, parts, etc.

National Brewing Co., O'Donnell and Conkling Streets, Baltimore, has filed plans for one-story plant unit, 70 x 140 ft. Cost over \$30,000 with equipment.

Charles K. Dodd, Punta Gorda, Fla., engineer, will draw plans for new local brewery for company now being organized. Tanks, pumping machinery and other operating mechanical equipment will be purchased soon. Cost over \$90,000 with equipment.

United States Engineer Office, Navy Building, Washington, asks bids until July 6 for new booster pumping station, etc., for Washington aqueduct, Washington.

City Council, Abingdon, Va., has authorized plans and surveys for a municipal electric

light and power plant, and waterworks. Cost over \$250,000 with machinery. J. B. McCrary Engineering Corp., Atlanta, Ga., is consulting engineer.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until June 27 for one cylinder grinding machine, honing type (Schedule 273) for Sewalls Point, Va., Navy Yard; 6750 lb. galvanized steel expanded metal (Schedule 267) for Portsmouth, Brooklyn and Norfolk yards; 20,100 lb. boiler plate steel (Schedule 294) for Newport, R. I., yard; storage batteries (Schedule 222) for Norfolk and Mare Island yards; 35 aluminum or corrosion resisting steel steam-jacketed kettles, each 20 to 80-gal. capacity (Schedule 214) for Mare Island yard; 45 oxygen cylinders with valves, each capacity 514 cu. in. (Schedule 296) for Philadelphia yard; sheet steel (Schedule 219) for Eastern and Western yards; sheet and slab zinc (Schedule 211) for Brooklyn, Mare Island and San Diego yards; pneumatic tool hose (Schedule 257) for Puget Sound yard.

◀ CENTRAL DISTRICT ▶

Joseph S. Finch & Co., Inc., Clark Building, Pittsburgh, distiller, has let general contract to Rust Engineering Co., Koppers Building, for two-story and basement bottling plant addition, 82 x 122 ft., at distillery at Schenley, Pa., including addition to power house and other extensions and improvements. Cost about \$100,000 with equipment. Carl J. Kiefer, Schmidt Building, Cincinnati, is consulting engineer.

Duquesne Brewing Co., Pittsburgh, recently organized, will take over Independent Brewing Co. of Pittsburgh, South Twenty-second Street. New company has arranged for a stock issue to total \$375,000, portion of proceeds to be used for expansion.

Wolverine-Empire Refining Co., 51 Madison Avenue, New York, has begun expansion and modernization at oil refinery at Reno, Pa., to include new topping unit, and installation of equipment. Cost about \$175,000 with machinery.

City Council, Wellsburg, W. Va., is considering erection of new municipal electric light and power plant. Cost over \$90,000 with equipment. Peter Loftus, Oliver Building, Pittsburgh, is engineer.

Kanawha Barge Lines, Inc., Charleston, W. Va., has leased about 1000 acres of coal lands at Crown Hill, near Charleston, and will develop. Plans are under way for erection of tipples for loading barges on Kanawha River. Cost over \$60,000 with equipment.

Murray Ohio Mfg. Co., 1115 East 152nd Street, Cleveland, manufacturer of sheet metal parts, has leased space in building of Hupmobile Co., East 131st Street, and will remove assembling and enameling departments to that location and increase capacity.

Miami Valley Brewing Co., First and Beckel Streets, Dayton, Ohio, has plans for one-story addition, including improvements in present works. Cost about \$75,000 with equipment. Konrad Keil, 1215 Windsor Street, is architect.

Belmont Stamping & Enameling Co., New Philadelphia, Ohio, has resumed operations on capacity schedule, with employment of normal working force of 350 men.

Woolner Malt & Beverage Co., 26 South Superior Street, Toledo, Ohio, is considering extensions and modernization, including additional equipment. Cost about \$35,000 with machinery.

W. A. Barrows Porcelain Enamel Co., Cincinnati, care of Clark & Robinson, Provident Bank Building, representative, has been organized by W. A. Barrows, Cincinnati, and associates, to manufacture metal enameled products.

Board of Public Works, Lakewood, Ohio, plans installation of pumping machinery, filtration equipment and other equipment, pipe lines, etc., for new municipal waterworks. A bond issue of \$1,500,000 will be arranged. Robert Wright Co., Swetland Building, Cleveland, is consulting engineer.

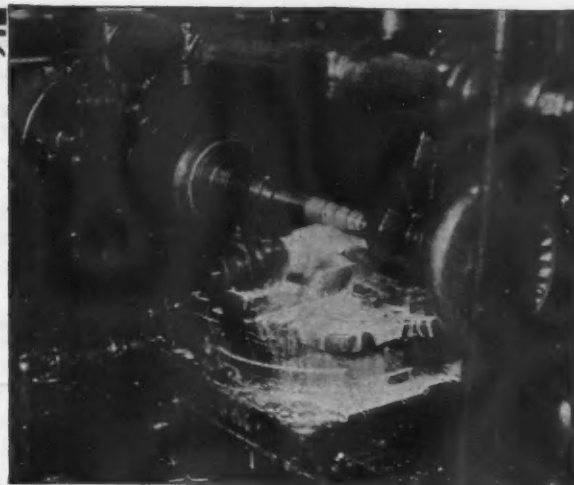
Kenton Structural & Ornamental Iron Works, Cincinnati, recently organized, has taken over former car repair shop of New York Central Railroad, Kenton, Ohio, for establishment of plant.

National Tile Co., Pitt Street, Anderson, Ind., plans new one-story machine shop.

OPERATION: HOBBIING, ROUGH CUT AND FINISH FROM SOLID STOCK. TRANSMISSION HELICAL SPLINE SHAFTS.

MACHINE: BARBER-COLMAN GEAR HOBBER.

MATERIAL: S.A.E. 3115.



PRODUCTION: 8 PIECES PER HOUR.

LENGTH AND DEPTH OF CUT: 6.25 IN. LONG AND .128 IN. DEEP ON EACH SIDE.

LUBRICANT: 1 PART SUNOCO TO 6 PARTS WATER.

[Courtesy of Canadian Acme Screw & Gear, Ltd., Toronto, Canada]

Fighting the Battle of Speed—Friction Production—Profits

THE battle of speed, friction, production and profits is fought right at the edge of the cutting tool.

And at this point, Sunoco Emulsifying Cutting Oil performs most satisfactorily its task as a cooling and lubricating agent, over the widest range of turning, milling, drilling, grinding and other metal working operations.

Increased production, more perfect work, lower cutting costs and greater profits are direct benefits derived from the use of Sunoco.

A trial in your plant under your own conditions will convince you of its merits.

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Akron, Albany, Allentown, Atlantic City, Baltimore, Battle Creek, Beaumont, Bridgeport, Buffalo, Chicago, Cincinnati, Cleveland, Columbus, Dallas, Dayton, Detroit, Flint, Grand Rapids, Harrisburg, Jackson (Mich.), Jacksonville, Miami, Newark, New York, Philadelphia, Pittsburgh, Providence, Reading, Rochester, Scranton-Wilkes Barre, Syracuse, Tampa, Toledo, Trenton, Wilmington, Youngstown.

Subsidiary Companies:

Sun Company . . . Tulsa

Sun Oil Co., Ltd., . . . Montreal and Toronto

British Sun Oil Co., Ltd., . . . London, England.

Old Vincennes Brewery, Inc., Vincennes, Ind., G. L. Shepard, president, has plans for extensions and improvements, including additional equipment. Cost about \$150,000 with machinery. M. F. Strauch, 3863 Lincoln Avenue, Chicago, is architect.

Muskegon Warehouse Corp., Old Grand Rapids Road, Muskegon, Mich., recently organized, capital \$100,000, by John Borden, head of Old Dutch Refining Co., Muskegon, plans bulk oil storage and terminal on Muskegon Lake, with steel tanks and equipment for capacity of about 250,000 bbl. Cost about \$90,000 with equipment.

Benton Harbor Malleable Industries, Inc., Benton Harbor, Mich., has acquired Hercules Products Co., St. Joseph, Mich., manufacturer of automobile tools, etc., and will operate as a subsidiary. Production will be resumed temporarily at St. Joseph works, and removal carried out later to Benton Harbor works, where production will be concentrated and increased.

Imperial Brewing Co., 260 Leonard Street, N. W., Grand Rapids, Mich., recently organized, has leased W. K. Philip Building, Leonard Street, and will remodel for new plant. Cost over \$70,000 with equipment. N. A. Schlangen is president, and W. B. S. Mathe-son, secretary and treasurer.

◀ MIDDLE WEST ▶

National Aluminate Corp., 6216 West Sixty-sixth Place, Chicago, manufacturer of chemical products, has let general contract to Strobel & Hall, 192 North Clark Street, for one-story addition for storage and distribution. Cost about \$40,000 with equipment. Ashby, Ashby & Schulze, 1410 West Jackson Boulevard, are architects.

Capitol Breweries, Inc., Chicago, E. C. Kramp, president, care of Richard C. Day, 10 South LaSalle Street, representative, has let general contract to Schillinger Advance Co., 2339 North Hoyne Avenue, for extensions and modernization in plant at Hartland, Ill. Cost about \$100,000 with equipment.

Star Brewery, Belleville, Ill., recently reorganized with capital of \$1,000,000, plans extensions and improvements. About \$25,000 will be expended for new equipment. Herman Studt and M. J. Fowle head new organization.

Bel-Ban Equipment & Service Corp., 77 West Washington Street, Chicago, has been organized by William Bell and J. M. Bandish, to manufacture mechanical equipment.

Brooks Elevator Co., Chamber of Commerce Annex, Minneapolis, G. R. Martin, vice-president, plans improvements and modernization in Brewery at Mankato, Minn., including new equipment. Cost about \$85,000 with machinery. G. J. Mayne is company engineer in charge.

New Prague Brewing Co., New Prague, Minn., is planning expansion and improvements, including additional equipment. Cost over \$50,000 with machinery. M. F. Rybak is manager.

Reid, Murdock Co., 314 North Clark Street, Chicago, food packer, has asked bids on general contract for rebuilding two-story canning plant, 40 x 200 ft., at West Chicago, replacing unit recently destroyed by fire. Cost about \$40,000 with equipment. E. O. Blake, Davis Street, Evanston, Ill., is architect.

Winston Corp., 802 North Chicago Street, Joliet, Ill., has been organized by Charles S. Winston and Martin J. Dougherty, Joliet, to manufacture miniature automobiles and parts.

Pure Oil Co., 35 East Wacker Drive, Chicago, plans new bulk oil storage and distributing plant at Hamtramck, Mich., in conjunction with Sun Oil Co., Philadelphia. Cost about \$80,000 with tanks, pipe lines, etc.

Lock Nut Corp. of America, Inc., Chicago, recently organized, will take over Boss Bolt & Nut Co., 3403 West Forty-seventh Street. New company will also acquire interest in Chapman Self-Locking Nut Co., Baltimore. A stock issue of \$310,000 has been arranged, portion of fund to be used for expansion.

Milcor Steel Corp., 4101 West Burnham Street, Milwaukee, manufacturer of stamped building materials, has purchased stove and elbow departments of Lamneck Products Co., Columbus, Ohio. Part of equipment is being transferred to Milcor branch factory at Canton, Ohio, and remainder to Milwaukee for extension of present similar departments.

Koller Tool & Die Co., Milwaukee, has been organized by Valentine Koller, 3428 South Burrell Street, formerly vice-president, Universal Tool & Die Co., and is establishing new plant at 2019 South Kinnickinnic Avenue.

Alloy Products Corp., Waukegan, Wis., manufacturer of stainless steel milk truck tanks

and other similar containers, has perfected new type of stainless steel beer barrel and is preparing to go into quantity production. Walter Wachowitz is president and general manager.

Supreme Steel Treating Corp., Milwaukee, has opened new heat treating shop at 119-123 West Scott Street.

◀ SOUTH CENTRAL ▶

American Medical Spirits Co., Bernheim Lane, Louisville, has plans for new multi-story distillery storage and distributing plant, 100 x 300 ft. Cost about \$90,000 with equipment. L. V. Abbott, 8 Kenwood Boulevard, is architect.

City Council, Tarrant City, Ala., is arranging financing for new municipal electric light and power plant, including acquisition of local distributing system, to be improved and extended. Cost over \$75,000 with equipment.

Planters Oil Mill Co., Tunica, Miss., manufacturer of cottonseed oil, let general contract to E. S. Morris, Clarksdale, Miss., for one-story storage and distributing plant, 80 x 150 ft. Cost about \$25,000 with equipment.

Heidelberg Brewing Co., 600 Madison Avenue, Covington, Ky., has plans for extensions and improvements in brewery, to include new malt house unit, mechanical bottling plant, tanks, refrigerating and other equipment. Cost over \$125,000 with machinery. Richard Grieser & Son, 64 West Randolph Street, Chicago, are architects. Joseph A. Ruhr is vice-president in charge of production. Company recently increased capital to \$400,000 for expansion.

City Council, Fort Thomas, Ky., is completing surveys for new municipal electric light and power plant. Cost over \$80,000 with equipment. Burns & McDonnell Engineering Co., Interstate Building, Kansas City, Mo., is consulting engineer.

City Council, Greensburg, Ky., will take bids soon for 75,000-gal. elevated steel tank, electric-operated centrifugal pump and other equipment for municipal waterworks. Howard K. Bell, McClelland Building, Lexington, Ky., is engineer.

◀ PACIFIC COAST ▶

El Rey Brewing Co., 5050 Mission Street, San Francisco, plans addition to brewhouse, with installation of equipment. Cost about \$50,000 with machinery. E. A. Mathews, Call Building, is architect.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until June 27 for 12 reversible pneumatic drills (Schedule 243) for Mare Island Navy Yard; 14 sterilizing tanks (Schedule 239) for San Pedro, Cal., and Puget Sound yards.

Eastern Oregon Brewery, La Grande, Ore., now being organized by George W. Singer, La Grande, and associates, with capital of about \$250,000, plans new brewery on local site. Initial unit will cost close to \$100,000 with equipment.

Richfield Oil Co., 555 South Flower Street, Los Angeles, is considering early rebuilding of absorption plant at refinery at Signal Hill, near Long Beach, Cal., recently destroyed by fire. Loss over \$350,000 with equipment.

Milwaukee Brewing Co., Tenth and Bryant Streets, San Francisco, has acquired adjoining property and plans multi-story addition to double capacity. Cost about \$100,000 with equipment.

Bureau of Yards and Docks, Navy Department, Washington, asks bids until June 28 for new gasoline filling station at naval air station, Sunnyvale, Cal., including piping and accessories (Specification 7301).

Westelectric Castings, Inc., Los Angeles, has been organized, capital \$60,000, by S. G. Lowe and John W. Feltes, 423 East Forty-first Street, to manufacture electric steel and other metal castings.

Willapa Harbor Iron Works, South Bend, Wash., N. R. Whitcomb, manager, plans immediate rebuilding of one-story molding shop, recently destroyed by fire.

George Windeler Co., Ltd., Eighth and Hooper Streets, San Francisco, manufacturer of tanks, etc., will take bids soon on general contract for one-story addition. Cost about \$24,000 with equipment. Reising & McGuinness, 488 Pine Street, are architects.

Samarkand Brewing Co., Ltd., 893 Folsom Street, San Francisco, is being organized by Jacob P. Rittenmayer, president and general manager, Samarkand Ice Cream Plant, same address, and associates, capital \$500,000, to erect a brewery. Sites are being considered at

San Francisco and Oakland, Cal. Plant will consist of several units and cost over \$200,000 with equipment. Peter G. Schmidt, president, Olympia Brewing Co., Olympia, Wash., will be identified with new company.

◀ SOUTHWEST ▶

City Council, Moberly, Mo., is considering erection of a municipal electric light and power plant. Cost close to \$700,000 with equipment and distributing system.

West Memphis Cotton Oil Co., West Memphis, Ark., has let general contract to Muskogee Iron Works, Muskogee, Okla., for one-story addition. Cost over \$50,000 with equipment. Company is considering further expansion.

City Council, Burlington, Kan., has been authorized to arrange bond issue of \$118,000 for new municipal electric light and power plant to cost \$85,000 with equipment, and electrical distributing system to cost \$33,000. E. T. Archer & Co., New England Building, Kansas City, Mo., are consulting engineers.

Board of Education, 6701 Delmar Avenue, University City, Mo., Charles Banks, superintendent, plans manual training department in new multi-story high school. Cost about \$350,000. William B. Ittner, Continental Life Building, St. Louis, is architect.

Mark C. Steinberg, Boatmen's Bank Building, St. Louis, is at head of project to purchase former Columbia Brewery, Madison and Twentieth Streets, and will expand and modernize for new plant. Cost over \$125,000 with machinery.

B. H. Collier, 3801 El Campo Street, Fort Worth, Tex., is at head of project to erect a new electric-operated ice-manufacturing plant. Company will be organized to carry out project. Cost about \$100,000 with equipment. A power house will be built.

◀ FOREIGN ▶

Director, Italian State Railways, Milan, Italy, has arranged financing in amount of 600,000,000 lire (about \$37,800,000) for electrification of number of lines, primarily from Milan along Eastern and Western coasts. Program will include overhead transmission and feeder lines, power substations, generating plant development, rolling stock, etc. This is part of complete electrification project for about 4100 track miles, to require about 10 years, at ultimate cost of \$300,000,000.

May & Baker, Ltd., Battersea, England, manufacturer of industrial chemicals, has approved plans for plant at Dagenham, scheduled to be completed in 10 to 12 months. Present works at Battersea and Wandsworth will be removed to new location and capacity increased. Cost over \$200,000 with machinery.

Manchurian Paint Co., Dairen, Manchuria, is interested in project to erect new plant at Mukden, Manchuria, for paint, varnish, processed oil and kindred manufacture, costing over \$100,000 with equipment. New company will be formed to carry out work, capitalized at 1,000,000 yen (about \$240,000).

TRADE NOTES

Taft-Peirce Mfg. Co., Woonsocket, R. I., has opened a new office and warehouse at 2921 East Grand Boulevard, Detroit, where a complete stock of gages, magnetic chucks and tools, including Martell reamers will be carried. M. L. Higgins, formerly Chicago branch sales manager, will be in charge of small tool and gage sales, and W. E. Rogers, Western district sales manager, will be in charge of sales in connection with the company's contract manufacturing and engineering division.

Allsteel Press Co., 12015 South Peoria Street, Chicago, manufacturer of Verson allsteel line of punch presses and sheet metal-working machinery, has appointed W. G. Nichol Co., Mariner Tower, Milwaukee, exclusive representatives in State of Wisconsin.

Smith-Monroe Co., 1910-12 South Main Street, South Bend, Ind., has been appointed South Bend representative for the Annis air filter, manufactured by Coppus Engineering Corp., Worcester, Mass.

This representative will specialize in applications of the Annis filter to air compressors and engines.

Torchwell Equipment Co., Chicago, has moved to larger quarters at 1035 West Lake Street in that city.

One of many popular industrial uses for ARMCO SPIRAL WELDED PIPE — a paper-mill stock line. Efficiency and low-cost dominant.

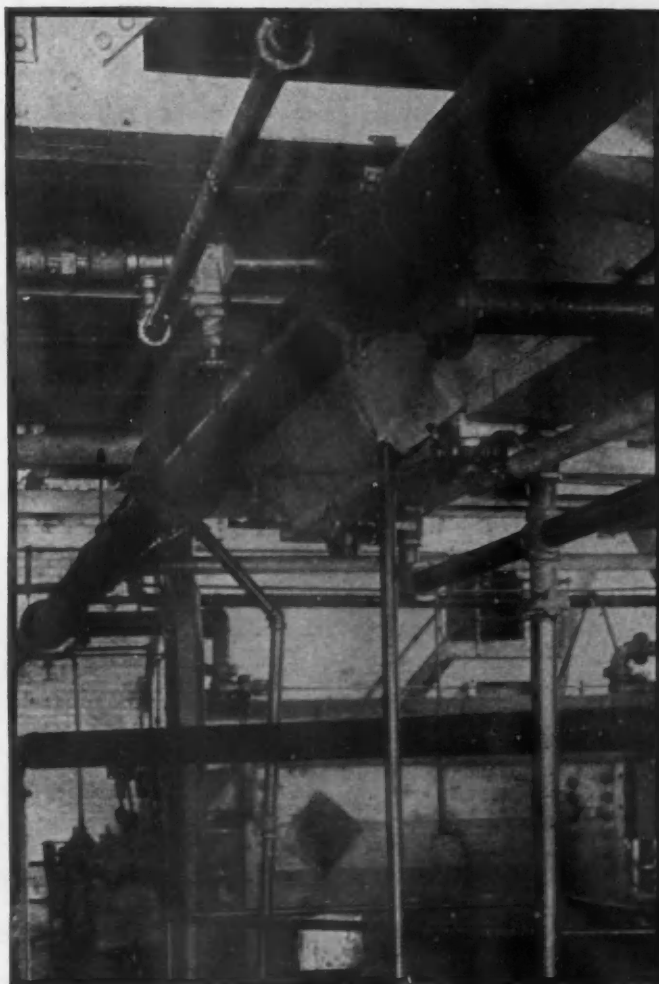
The all-round LOW-COST PIPE for industrial pipe lines

TALK all you like about cutting pipe-costs, but when it comes to ease of installation, increased flow and volume, and long, money-saving service, Armco Spiral Welded Pipe is hard to equal. At least, that is what industrial users tell us.

Here is why, they say . . . Armco Spiral Welded Pipe is trimly designed, yet strong enough to do the work that was once thought only heavy-walled pipe could do. Not a pound of excessive weight in a shipment. You pay only for the wall-metal you actually need; not a cent more. And with it you get pipe that handles surprisingly easy and goes in fast.

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You can order Armco Spiral Welded Pipe in any diameter from 6 to 24 inches. Lengths run



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SPIRAL WELDED PIPE
Cuts Piping Costs
ALL ALONG THE LINE

Starts Production of Cement Guns

Machines for pneumatic application of cement, concrete and refractory materials have been placed in production by the Gunitor Co., Elkhart, Ind., which was organized recently, with C. L. Dewey president and general manager, W. M. White vice-president, and S. L. Dewey secretary.

Uses of these machines include application of concrete and cement to structural steel, lining of bunkers and reservoirs, applying crushed firebrick, fire clay and other refractory materials to boiler fire boxes, and the building up of arches. Denser, stronger, more uniform and less expensive surface is said to be obtained as compared with hand application. Several sizes of Gunitors will be offered.

National Wealth Down \$115 Billion in 1932

The national wealth of the United States shrank from \$362 billion in 1929 to \$247 billion in 1932, or from \$2,977 per capita to \$1,981 per capita, according to estimates announced by the National Industrial Conference Board in a bulletin entitled "Estimating the National Wealth."

The national wealth reached its peak in 1920 at \$488.7 billion, or \$4,587 per capita. The next year, 1921, saw it drop to \$317.2 billion, or \$2,932 per capita. In the following years fluctuations were confined within relatively narrow limits until 1931, when the national wealth dropped to \$280.3 billion.

French Steel Exports Above 1932 Levels

Exports of iron and steel products from France for the first quarter of this year were above levels of the corresponding period in 1932, according to the Commerce Department's iron and steel division.

Foreign shipments of French iron and steel products for the first three months of this year totaled 590,715 metric tons. Average monthly shipments for the first quarter of this year amounted to 196,905 tons compared with the average monthly exports of 184,500 tons for 1932, an increase of 12,400 tons.

Principal items entering into the French export trade with their three months' total for 1933 were as follows: Bars, 268,865 tons; ingots, blooms, billets and slabs, 73,666 tons; pig iron, 47,865 tons; wire rods, 35,032 tons; plates, 34,285 tons, and rails, 30,243 tons.

Production in France amounted to

1,465,000 metric tons of pig iron and 1,589,000 tons of steel ingots and castings, while the Saar produced 351,000 tons of pig iron and 371,000 tons of steel. At the close of the quarter there were 85 blast furnaces operating in France, while 126 were blown out.

Steel Mill Engineers Will Meet in Pittsburgh

Pittsburgh has been selected by the board of directors of the Association of Iron and Steel Electrical Engineers as the 1933 Convention City. The convention will be for three days, Oct. 17, 18 and 19, 1933. Convention plans include an Iron and Steel Exposition at the William Penn Hotel, where the latest steel mill equipment will be displayed.

The five divisions of the association (mechanical, lubrication, combustion, electrical and safety) will meet with simultaneous sessions and a technical program is being arranged for each division.

A feature of the technical sessions will be the announcement of the winners of the association's campaign for "New Uses for Steel." Originally the campaign was to end May 15 but owing to the date of the convention being changed the time limit has been extended to Sept. 15.

Offers Advanced Course In Welding

John Huntington Polytechnic Institute, Cleveland, has planned another advanced welding course, to begin July 10. It is designed to give engineers and experienced operators an opportunity for a week's intensive study from both practical and theoretical standpoints. Daytime sessions will be at the plant of the Lincoln Electric Co., which has offered the facilities of its welding school. Evenings will be occupied by lectures at the institute. At the welding school there will be practice, demonstrations and lectures on welding machines, electrodes and automatic welding. The prospectus includes the welding of alloy steels and non-ferrous metals. The only charge for the course is for the materials used in practice work. E. W. P. Smith, welding engineering department, John Huntington Polytechnic Institute, is in charge.

G. M. Sales for May

May sales of General Motors cars to dealers in the United States and Canada, together with shipments overseas, totaled 98,205 as against 86,967 in April, and 66,739 in May a year ago.

Handbook on Welded Tubing

Comprehensive engineering data and standard practice information highly useful to purchasers of steel tubing are contained in the Handbook of Electric Weld Tubing, published by Steel & Tubes, Inc., Cleveland, a unit of the Republic Steel Corp.

Manufacture by the Johnston process is outlined, and weld characteristics are described and illustrated. Materials used, physical properties of the welded tubing, surface finishes, and trade terms for various types and finishes of tubing are included. Sections are devoted to mill practice and trade customs and to data necessary when ordering the welded tubing. Square, rectangular and special shapes, tolerances, methods of checking tolerances, bent tubing, methods of cutting tubes into short lengths, swaging and flanging are among other subjects covered. List prices and extras are included. The handbook contains 68 pages, 4 1/4 x 6 1/2 in., and is indexed for ready reference.

New Company to Build Resistance Welders

The National Electric Welding Machines Co., 1846 North Trumbull Street, Bay City, Mich., has been organized to manufacture a complete line of standard and special resistance welders. It succeeds the Valley Castings & Pattern Co., Bay City, which for 16 years has specialized in non-ferrous castings for resistance welders, as well as making wood and metal patterns. In addition to its own foundry and pattern shop, the new company will operate a machine shop, assembly and testing departments.

E. C. Smith, formerly secretary and manager of the Valley Castings company, is president, and J. R. Brueckner, who has been works manager and chief field engineer, respectively, of the Thomson-Gibb Electric Welding Co., will be vice-president, in charge of sales. Charles E. Shearer, formerly advertising manager of the Thomson-Gibb company, is secretary-treasurer of the new company. Mr. Shearer will handle the company's advertising and sales promotion work. H. C. Cogan is chief engineer in charge of design, and W. L. Mueller is works manager of the new company. District offices will be located in Detroit, Cleveland, Chicago and St. Louis.

The standard line, production of which is to begin immediately, will include manual, air, hydraulic and motor-driven automatic and semi-automatic spot, seam, butt and flash welders of new design.

Continental Tool division of Ex-Cell-O Aircraft & Tool Corp., Detroit, has moved from 5835 Martin Avenue to the main plant of the Ex-Cell-O company at 1220 Oakman Boulevard.



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Industrial Exhibits At the World's Fair

The spectacle of a huge converter pouring its contents is one which will be seen by every visitor who views the United States Steel exhibit at A Century of Progress.

No little mystery surrounds the methods by which the great model converter, which is the major display of the steel exhibit, has been made so realistic in its performance. When the lights in the great hall are dimmed, the converter, high above the heads of the crowd, begins to tip, and what appears to be actual white-hot metal cascades down in a gleaming stream of fire.

Forming a part of the central display, realistic models of ocean liners, automobiles, steel bridges, skyscrapers, locomotives, machines—all kinds of steel-made products—are grouped about the base of the converter. Immediately following the dramatic tipping of the converter, these models are outlined in detail by concealed lights focused on them. It is as though the white-hot metal had been cast instantly and invisibly into an array of familiar products made of steel.

As the visitor walks past the major display to begin his tour of the steel industry, his first sight is of an open pit ore mine—a great red gash in the earth's surface from which the raw ore is being scooped and loaded into waiting gondola trains, which transport it to ore boats in the harbor for its journey to the mills. Next is a blast furnace in full operation, with the metal being drawn. Then is seen an open-hearth furnace. Another few steps and the steel is seen in the slabbing mill, and next in the rolling-mill.

Industrial settings follow, depicting steel in its services to mankind; steel in transportation, in the air, on the sea, in the home and on the farm, steel in industry and commerce and construction. These displays give a comprehensive "bird's-eye view" of the ways in which the basic metal has contributed to the progress of these essentials of everyday life. And in the background of each of these displays unfolds the story of that progress, step by step throughout the past century.

In one section of the great hall there is a display which attracts unusual interest. There, encased in glass, are large bins. In each bin is a familiar material—coal, limestone, iron ore and other raw materials. In front of these tons of material is a single piece of finished steel, weighing one ton. There is the story of steel in a glance—from tons of varied raw material, comes only a single ton of steel.

The stainless steel display is presented in an array of products which

range from stainless kitchen pots and pans to equally stainless industrial units.

Housed in the northern wing of the General Exhibits Building, this presentation of the subsidiary companies of the United States Steel Corp., combines interest and instruction with the story of steel's progress.

A number of new and highly important developments in the field of copper and copper alloys are revealed in the exhibit of the Copper and Brass Research Association in the mineral industries pavilion of the general exhibits group at the World's Fair.

These pertain not only to new finishes designed to meet certain architectural whims but also to special alloys of copper to fill demands in general manufacturing. Copper is shown with a green patina produced artificially by a process similar to that of Mother Nature, save that what ordinarily would require months to achieve now can be done in a very few hours. Crystal-cote, which is a thin and flexible coating of glass on copper, to preserve untarnished the original luster of the metal and even add colors not previously attained on it, has its first public showing at the ex-

hibit. A feature, also, is a new copper sheet which is as thin as paper and for which its producers assert there will be many uses, such as for room decoration and for automobile tops.

The exhibit, in all, occupies 1200 square feet of floor space. The copper, brass and bronze products are shown on great panel boards and in cases. An important feature is the lighting effect which includes an electrical storm in progress over a dwelling house in miniature, and one that is realistic in every detail.

In addition to its exhibit in the mineral industries building, the copper industry is strikingly represented in the central station industry exhibit in the electrical group. A feature of this exhibit is the "copper highway." On entering the building the visitor encounters the figure of a gigantic man, in copper, one hand on the throttle of an electric generator, the other pointing to huge copper letters advising him to "Follow electricity down the copper highway."

The "copper highway" consists of a triple line of copper bus bars, extending a distance of 875 feet, on each side of which are the latest wonders of the electrical age.

Testing Safety Razor Blades

(Concluded from Page 983)

even advisable to coat the edge lightly with thin oil to secure long life. Often stropping the blade lightly over the palm of the hand will supply enough oil for protection and in addition furnishes some actual stropping action. This procedure should also be carried out before a blade is used for the first shave and will help in removing a "wire edge" if one exists.

Mechanical sharpeners can, of course, be used to restore the sharpness of dull blades, but their repeated use will destroy the accuracy of the dimensions of the blade so that eventually they will not work properly with the associated guard and holder.

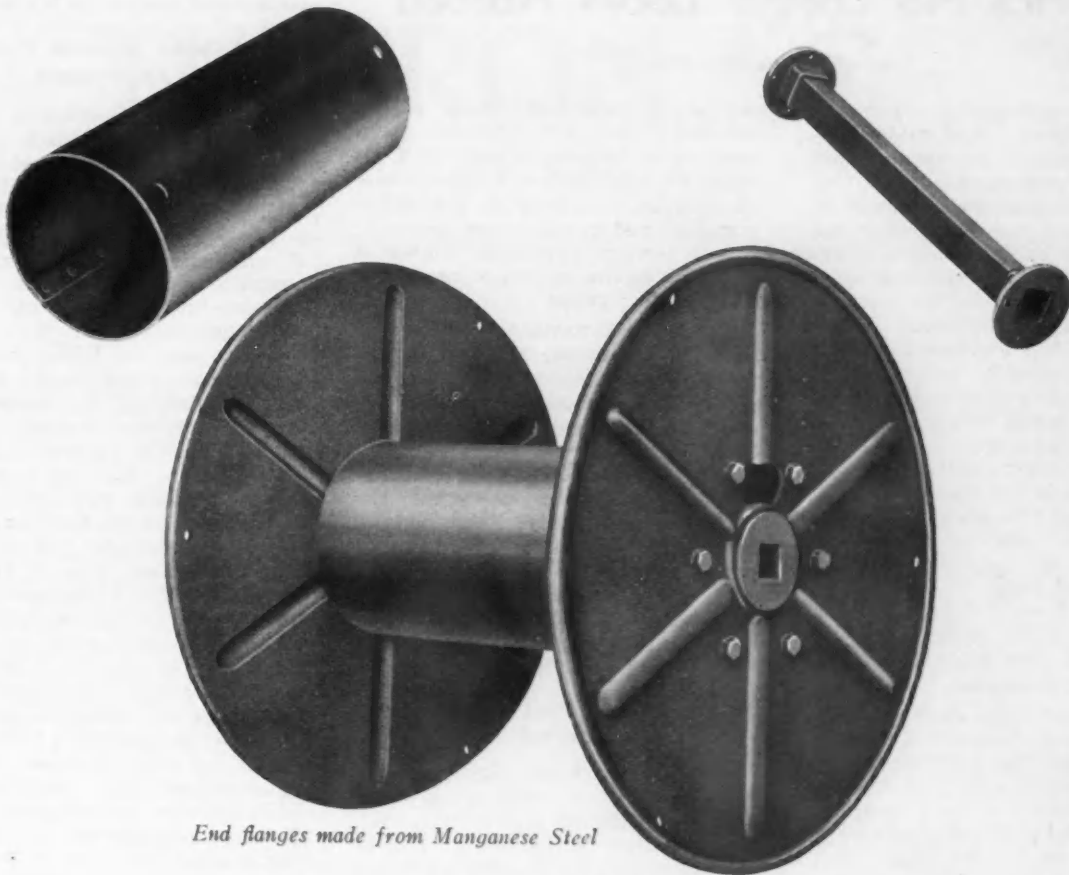
A device on the market called a magnetic sharpener is also beneficial in prolonging the life of blades. Strictly, the device is not a sharpener, but a sharpness retainer. When not in use the blade is kept with the cutting edges on the poles of a strong permanent horseshoe magnet. Although its action is not thoroughly understood, it is possible that the hardness of the steel at the very tip of the cutting edge is increased by a process analogous to the magnetic hardening described by Herbert in England. The writer has observed a small increase of hardness in the body of blades so treated, but it is of course quite difficult to measure any increase in hardness at the cutting edge. At this

point the magnetic flux is greatest and changes in hardness should be more pronounced.

By applying some of these means to increase the life of blades it is perfectly possible to obtain 25 to 50 satisfactory shaves from average blades produced by reputable manufacturers. As better manufacturing processes are developed and inspection methods further refined, it may be expected that the life of blades can be increased and, of more importance, that much greater uniformity will be attained. Indeed there are rumors of blades of special materials and of nitrided steel that have practically infinite life, but such blades, at least according to the ideas of technocracy, would be ruinous to the industry.

Waste Association To Meet in August

The twentieth annual convention of the National Association of Waste Material Dealers, Inc., and embracing many divisions and affiliated associations, will be held at the Hotel Sherman, Chicago, on Aug. 7, 8 and 9. The same program that was to have been followed had the convention been held as originally scheduled in March will be carried out at the August meetings, and in addition there will be the big problem of ways and means of fully cooperating with the government in applying and dusting the provisions of the National carry out in the waste material in Industrial Recovery Act.



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America No Longer Looks Abroad

(Concluded from Page 980)

print in his newspapers and magazines is duty-free. And automobiles, trucks and gasoline are cheaper than in any other important country. Almost all of the farmer's important requirements are free from tariff-created burdens except tobacco, sugar and woolen and cotton goods on which duties were imposed for the supposed benefit of the farmer himself.

A fact which is overlooked or deliberately suppressed by low tariff advocates is that two-thirds of our imports (in terms of value) come into this country duty free. As a result the average duty received by the United States in the fiscal year 1931-1932 was only 17.9 per cent of total import values. This compares with 17.4 per cent for the traditional free trade country, Great Britain. Since the British have substantially increased their duties in the past year, their average duty probably exceeds ours at the present time.

Now we have found that the quantity of our foreign trade has declined much less than the quantity of our domestic business, that our foreign business in terms of both quantity and value is insignificant compared to our internal trade, and finally that the lion's share of our tariff revenue comes from duties on agricultural products. It should be clear that the argument that a lower tariff is necessary to relieve agriculture of unfair advantages enjoyed by industry is not well founded.

Our Disappearing Creditor Position

We still face the argument that we must have larger imports because of our creditor position. In the calendar year 1931 we exported \$334,000,000 more than we imported. However, our invisible imports, more than half of which was tourist traffic abroad, amounted to \$1,068,000,000, while our invisible exports totaled \$956,000,000. This means we had an unfavorable invisible trade balance of \$112,000,000. Since the return on our private investments abroad is steadily diminishing, in some cases disappearing, and we face formal or de facto cancellation of the war debts, the invisible balance against us is likely to increase. In other words, we may again be definitely in a debtor position in world trade and that means larger exports and smaller imports, rather than the reverse.

The theory that this country requires larger imports to insure economic recovery has no foundation in the facts. On the contrary, the first definite steps taken to increase our protection from imports really set in motion the remarkable rebound in American business activity which we have witnessed in recent weeks. The immediate effect of the gold embargo

was to depreciate the dollar in the markets of the world. This was equivalent to an increase in our tariff. It halted the irresistible downward course of deflation. So long as the dollar remained tied to gold, every depreciation in foreign currencies resulted in a further decline in gold prices, which meant dollar prices.

And free gold payments accentuated deflation in another way. Although foreign countries are heavily indebted to the United States on long term, many of them had large short term balances here, which could be withdrawn in gold virtually on demand. This circumstance prevented the Hoover administration from making any headway with its credit expansion program. In fact, every time our Federal Reserve banks embarked on large open-market purchases of securities, the effect was nullified by large foreign gold withdrawals.

Gold Embargo First Step Toward Control

The gold embargo has brought our credit system under our control. And the national recovery act aims to bring our industrial system under control. It has the merit of limiting itself to objectives attainable within our own borders. Whatever may be agreed to at the London conference will not be under our control. International agreements are always uncertain and in this instance may result in greater harm than good from our point of view. We cannot safely lower our tariff barriers when we have launched a domestic program that may require greater rather than less protection. We cannot return to the gold standard at a time when monetary isolation is essential to protect us from further price deflation. We cannot pool our economic life with that of Europe at a juncture when our economic philosophy is moving rapidly away from any concept held abroad.

An American Economic Concept

The economic concept which has found expression in the national recovery act is not an entirely new one in this country. For years we have drifted toward it, unawares as it were. It is only now that it has come into full flower. It is a concept entirely distinct from any prevailing abroad. In Europe, trade is still envisioned as an exchange between countries. Labor there is an element of cost, which must be kept down if employed or supported by public funds if idle. Such a conception is not surprising in countries where caste ideology is still strongly entrenched, where people of the so-called "great world" are the only ones that count and where the little peo-

ple—the workmen, the peasants, the clerks—are ignored so far as possible.

Cut-throat Business Practices Are Doomed

The American concept is a natural outgrowth of conditions in a country only a generation removed from the frontier, a country of fluid rather than petrified classes, a country where a man is still a man for a' that. We, of all nations, realize the interdependence of all our people. The depression brought this truth home as never before. When the workman couldn't pay his bills, the retailer couldn't pay the wholesaler, the wholesaler couldn't pay the manufacturer, the manufacturer couldn't pay the banker, and the banker couldn't pay the depositor. We have learned that we are literally our brothers' keepers. We must restore employment and fair wages and this implies the end of cut-throat prices. If we can do this without Government aid, so much the better, but we certainly cannot do it if the foreign price cutter is allowed to enter. If we cannot achieve our ends without President Roosevelt's big stick, then let the big stick get into action. That is the reality we face. Freedom of trade, either domestically or internationally, which permits unrestrained slashing of prices and unrestricted exploitation of labor, is a thing of the past so far as this country is concerned.

Electrical Engineers Rather Well Employed

Although there has been a rush into electrical engineering since the war decade, the market for such engineers does not seem to have become oversaturated, for, according to Col. Walter V. Bingham, director of the Personnel Research Federation, Inc., New York, the ratio of electrical engineers at present unemployed, at least in the New York area, is smaller than that of mechanical or civil engineers. The rapid drift into mechanical engineering, he said, reached a peak during the war period.

The federation gathers information and systematizes whatever data it can find to throw light on the relative absorptive capacity of the different occupations and professions. Colonel Bingham, in an address before the City Club of New York, mentioned that the number of chemists, among others, has been increasing at a rapid rate, as has also that of technical engineers, although the rate in increase of the latter has not been so high. Any national economic planning that ignores the problem of occupational distribution and the related educational problem of occupational preparation overlooks, he said, a vital factor in the equation of industrial adjustment.